



Final

Forever Homes, Commissioners Road, London

Subject Lands Status Report and Environmental Impact Study

Prepared for:

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Forever Homes, Commissioners Road, London
Subject Lands Status Report and Environmental Impact Study

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Table of Contents

1.0	Introduction	1
1.1	Project Scoping	2
1.1.1	Species at Risk and Species of Conservation Concern Screening	3
1.1.2	Significant Wildlife Habitat Screening	4
2.0	Relevant Policies, Legislation and Planning Studies	5
3.0	Field Methods	4
3.1	Terrestrial Field Surveys	6
3.1.1	Ecological Land Classification and Vegetation Inventories	6
3.1.2	Tree Inventory	6
3.1.3	Butternut Health Assessment	6
3.1.4	Woodland Dripline Delineation	7
3.1.5	Bat Habitat Assessment	7
3.1.6	Breeding Bird Surveys	7
3.1.7	Common Nighthawk Surveys	8
3.1.8	Snake Emergence Surveys	8
3.1.9	Habitat Assessments and Documentation of Other Wildlife	8
3.2	Aquatic Surveys	8
3.2.1	Aquatic Habitat Assessment	8
4.0	Existing Conditions	10
4.1	Soil, Terrain and Drainage	10
4.2	Designated Natural Areas	11
4.3	Vegetation	11
4.3.1	Vegetation Communities	11
4.3.2	Vascular Flora	13
4.3.3	Tree Inventory	14
4.4	Wildlife	15
4.4.1	Birds	15
4.4.2	Herpetofauna	17
4.4.3	Mammals	17
4.4.4	Butterflies	18
4.4.5	Odonata	19
4.5	Aquatic Habitat	19
5.0	Significance and Sensitivity of Natural Features	24

5.1	Significant Woodlands	24
5.2	Environmentally Significant Areas	25
5.3	Significant Wildlife Habitat	25
5.3.1	Seasonal Concentration Areas	25
5.3.2	Habitat for Species of Conservation Concern.....	25
5.4	Habitat of Endangered and Threatened Species	26
5.4.1	Butternut.....	26
5.4.2	Eastern Meadowlark	27
5.4.3	Species at Risk Bats.....	27
5.5	Drainage Features and Fish Habitat	28
5.6	Corridors and Linkages	28
6.0	Recommended Ecological Buffer	29
7.0	Impact Analysis, Net Effects Assessment, and Recommendations	30
7.1	Description of the Proposed Undertaking	30
7.2	Approach to Impact Analysis and Net Effects Assessment	30
7.3	Proposed Buffer	31
7.4	Existing Impacts	32
7.5	Direct Impacts	33
7.5.1	Vegetation Removal.....	33
7.5.2	Species at Risk	35
7.5.3	Site Contamination	37
7.6	Indirect Impacts	37
7.6.1	Site Grading.....	38
7.6.2	Alterations to Surface Water and Water Balance	38
7.6.3	Changes to Water Quality	40
7.6.4	Construction Runoff, Erosion, and Sedimentation	40
7.6.5	Impacts and Disturbance to Adjacent Natural Features and Wildlife	41
7.6.6	Occupancy of Future Development.....	42
8.0	Environmental Management and Monitoring Plan	50
8.1	Environmental Management	50
8.2	Monitoring	50
8.2.1	During Construction	51
8.2.2	Post-Construction	51
9.0	Summary	53
9.1	Summary of Recommendations	54

10.0 References	58
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List of Tables

Table 1. Relevant Policies, Legislation, and Planning Studies.....	1
Table 2. Field Investigations Completed Within the Subject Property.....	4
Table 3. Vegetation Communities Identified within the Subject Property	12
Table 4. Results of Butternut Health Assessments and Genetic Testing	14
Table 5. Summary of Inventoried Trees Within the Subject Property.....	14
Table 6. Overall Health of Trees Inventoried	15
Table 7. Summary of Bat Cavity Trees.....	18
Table 8. Net Effects Assessment Table.....	44

List of Appendices

Appendix I Environmental Study Scoping Checklist and Correspondence	
Appendix II Species at Risk Screening	
Appendix III Significant Wildlife Habitat Screening	
Appendix IV Vascular Flora Species Observed within the Subject Property	
Appendix V Tree Inventory Data	
Appendix VI Bird Species Reported from the Study Area	
Appendix VII Herpetofauna Species Reported from the Study Area	
Appendix VIII Mammal Species Reported from the Study Area	
Appendix IX Lepidoptera Species Reported from the Study Area	
Appendix X Odonata Species Reported from the Study Area	
Appendix XI Conceptual Site Plan Layouts, 168 Meadowlily Road South, Forever Homes	

Maps

Map 1. Study Area and Natural Features	
Map 2. Monitoring Locations	
Map 3. Existing Conditions	
Map 4. Aquatic Habitat Assessment	
Map 5. Significance and Sensitivity	

Map 6. Proposed Development Concept

1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained by Forever Homes Inc. in November 2022 to complete a Subject Lands Status Report (SLSR) and Environmental Impact Study (EIS) for a proposed medium and high-density residential development on the property located at 168 Meadowlily Road South in London, Ontario. The Meadowlily Woods Environmentally Significant Area (ESA) is located to the immediate north of the subject property and partially overlaps its northern edge. The portions of the ESA which are present adjacent to and overlapping the subject property are comprised primarily of woodland communities. The presence of the ESA and woodland triggered the requirement for an SLSR and EIS to be completed, as per the London Plan (City of London 2023) and the City of London Environmental Management Guidelines (EMG) (AECOM 2021).

For the purposes of this report, the term “subject property” refers to the property owned by the proponent at 168 Meadowlily Road South, that is the subject of the development application and within which studies were completed to prepare this SLSR and EIS. The term “study area” refers to the subject property plus lands within approximately 120m. Detailed biological surveys were undertaken by NRSI on the subject property. Legacy data collected from background sources and agency consultation encompassed the study area to ensure that all surrounding natural features were considered. Aquatic habitat assessment surveys were conducted within the ESA to assess drainage from the subject property, all other field surveys were limited to subject property.

The subject property, rectangular in shape, is approximately 8.1ha in area, bordered by the Meadowlily Woods ESA to the north, a city-owned sports park to the east, Commissioners Road East to the south, and Meadowlily Road South to the west, beyond which are residential lots and agricultural fields (Map 1). The subject property is comprised primarily of an agricultural row crop field with a small unoccupied residential area central to the subject property and accessed from Commissioners Road East, containing an old foundation, sealed well, and scattered trees. A small area of deciduous forest (FOD5-1) is present in the northwest portion of the subject property where it overlaps with Meadowlily Woods ESA, and a hedgerow is present along the northern and eastern property boundaries. Several small drainage features are present along the northern edge of the subject property, which are located entirely within the FOD5-1 community and northern hedgerow. The subject property is located within Ecoregion 7E.

This report summarizes the work completed and includes background information for the subject property and study area, the results of original field surveys including for breeding birds, reptiles, vegetation communities and vascular flora, tree inventory, aquatic assessment, and incidental wildlife. This report includes the identification and description of sensitive and significant natural features and species in the study area and constraints to the proposed development. An analysis of impacts based on the proposed development concept plan was completed by comparing the natural features to the proposal and following local and provincial policies and guidance.

1.1 Project Scoping

In order to determine a study approach and scope for the SLSR and EIS, existing natural heritage information was gathered through the preparation of a Due Diligence study for the subject property. NRSI completed the Meadowlily Woods ESA Conservation Master Plan (CMP) Phase 1 (2019) and is very familiar with the study area. Background information was gathered from this document, as well as from the Ontario Ministry of Natural Resources and Forestry (MNRF) Aylmer District, the Ministry of Environment, Conservation and Parks (MECP), and Upper Thames River Conservation Authority (UTRCA). Background information on the natural environmental features within the study area was gathered from the following sources:

- The London Plan (City of London 2023);
- City of London Environmental Management Guidelines (AECOM 2021);
- Commissioners Centres Ltd. Meadowlily Road South & Commissioners Road Environmental Impact Study (Dillon Consulting Limited 2008);
- Meadowlily Woods Environmentally Significant Area Conservation Master Plan – Phase 1 (NRSI 2019);
- UTRCA Regulated Area Screening Map (2021);
- MNRF Make a Map: Natural Heritage Areas online mapping tool (MNRF 2022);
- Government of Canada Species at Risk Act (SARA) Registry (2023);
- Ontario Breeding Bird Atlas (BSC et al. 2008);
- Ontario Reptile and Amphibian Atlas (ORAA) (Ontario Nature 2019);
- Atlas of the Mammals of Ontario (Dobbyn 1994);
- Ontario Butterfly Atlas (MacNaughton et al. 2022);
- Ontario Odonata Atlas (OOAD) (2022); and
- Supplementary resources including eBird (eBird 2022) and iNaturalist (iNaturalist 2022).

The wildlife atlases above provide data based on 10x10km survey squares. Information was compiled from the atlas square that overlaps the subject property (square 17MH85).

This EIS has been developed in accordance with the City of London's EMG (AECOM 2021). As per the guidelines, an Environmental Study Scoping Checklist as finalized during the Site Suitability and Scoping meeting held with representatives from NRSI, the City of London, the Ecological Community Advisory Committee (ECAC), and the Upper Thames River Conservation Authority (UTRCA). This meeting was held on April 12, 2023 and the EIS Environmental Study Scoping Checklist is appended to this report (Appendix I).

1.1.1 Species at Risk and Species of Conservation Concern Screening

Initial wildlife species lists for the area were developed using these background sources and informed a screening exercise to determine the potential for Species at Risk (SAR) or Species of Conservation Concern (SCC) to occur within or adjacent to the subject property.

SAR are those listed on the Species at Risk in Ontario (SARO) list (MECP 2024), and include species identified by the Committee on the Status of Species at Risk in Ontario (COSSARO) as provincially Endangered, Threatened, or Special Concern. Regulated SAR refer to species listed as Endangered or Threatened, due to the protection afforded to the species and their habitat under the Endangered Species Act, 2007.

SCC includes species that are:

- Designated provincially as Special Concern (MECP 2024),
- Assigned a conservation status (S-Rank) of S1 to S3 or SH (i.e., critically imperiled, imperiled, vulnerable, or historical) (MNRF 2022),
- Designated federally as Threatened or Endangered by the Committee for the Status of Endangered Wildlife in Canada (COSEWIC) (Government of Canada 2023), but not provincially by the COSSARO. These species are protected by the federal Species at Risk Act (SARA) but not provincially by the Endangered Species Act.

SCC are discussed further within the context of Significant Wildlife Habitat (SWH).

This SAR/SCC screening exercise was conducted to identify which species may have suitable habitat within the study area. The screening exercise involved cross-referencing the preferred habitat for reported SAR (MECP 2024) against habitats known to occur within the subject

property or adjacent lands. Several SAR were identified as having potentially suitable habitat within the subject property.

Full results of the SAR/SCC screening exercise, updated with the results from field surveys, are provided in Appendix II.

1.1.2 Significant Wildlife Habitat Screening

The Significant Wildlife Habitat Technical Guide (SWHTG) is a guideline document that outlines the types of habitats that the MNRF considers significant in Ontario as well as criteria to identify these habitats (OMNR 2000, MNRF 2015). The SWHTG groups SWH into four broad categories:

1. seasonal concentration areas,
2. rare vegetation communities and specialized wildlife habitat,
3. habitats of SCC, and
4. animal movement corridors.

A SWH screening exercise compared site conditions with criteria set in the SWH Ecoregion 7E Criterion Schedule (MNRF 2015) to determine the presence of any candidate SWH within the Study Area.

Full results of the SWH screening exercise, updated with the results from field surveys, are included in Appendix III.

2.0 Relevant Policies, Legislation and Planning Studies

Natural features and species in the study area were evaluated against the relevant local, provincial and federal policies, legislation, and planning studies, to help inform suitable land-use concepts, guide the layout of development, and identify areas to be protected. This analysis is shown in Table 1.

Table 1. Relevant Policies, Legislation, and Planning Studies

Policy/Legislation/ Plan	Description	Project Relevance
Provincial Policy Statement (OMMAH 2020)	<ul style="list-style-type: none"> Issued under the authority of Section 3 of the Planning Act and in effect since May 1, 2020, replacing the 2014 PPS. 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 (OMNR 2010) and the Significant Wildlife Habitat Technical Guide (OMNR 2000) and the MNRF to provide guidance on identifying natural features and in interpreting the Natural Heritage sections of the PPS. 	<ul style="list-style-type: none"> Natural features were identified within the study area which have implications under the PPS: <ul style="list-style-type: none"> Significant Woodlands, Habitat for Endangered and Threatened species, Confirmed and Candidate Significant Wildlife Habitat
Endangered Species Act, 2007	<ul style="list-style-type: none"> The ESA came into force in 2007. The ESA prohibits killing, harming, harassing or capturing Endangered and Threatened species and protects their habitats from damage and destruction. 	<ul style="list-style-type: none"> Through the completion of field studies SAR habitat was confirmed for plants with in the subject property and considered candidate for mammals within the study area.
Migratory Birds Convention Act, 1994	<ul style="list-style-type: none"> The MBCA protects migratory game birds, insectivorous birds, and several other migratory non-game birds from persecution in the form of harassment and was assented in 1994. The schedule of on-site work must consider MBCA timing windows, with the breeding bird season typically occurring between April 1 and August 31, however, this is a guideline, since the MBCA applies to nesting bird species at any time. “Incidental take” is considered illegal, with the exception of a permit obtained by the Canadian Wildlife Service (CWS). 	<ul style="list-style-type: none"> The timing of construction activities, especially vegetation clearing and site grading, must have consideration for migratory birds as outlined in the MBCA.
Fish and Wildlife Conservation Act, 1997	<ul style="list-style-type: none"> The FWCA provides protection for certain bird species not protected under the MBCA (e.g. raptors), as well as furbearing mammals and their dens or habitual dwellings, aside from the Red Fox (<i>Vulpes vulpes</i>) and Striped Skunk (<i>Mephitis mephitis</i>). 	<ul style="list-style-type: none"> The timing of construction activities, especially vegetation clearing and site grading, must have consideration for bird nesting and den sites of furbearing mammals as outlined in the FWCA.

Policy/Legislation/ Plan	Description	Project Relevance
Canadian Fisheries Act, 1985	<ul style="list-style-type: none"> Manages threats to all fish and fish habitats in Canada. The Act prohibits harmful alteration, disruption or destruction of fish habitat (HADD). Fisheries and Oceans Canada (DFO) requires any development that may alter fish habitat to undergo a formal Request for Review process based on the type of water body the work is occurring in and the nature of the proposed activity. 	<ul style="list-style-type: none"> The approach to stormwater management may have implications to fish habitat.
The London Plan (2016, consolidated version May 2023)	<ul style="list-style-type: none"> The City of London's new 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 the Province in 2016; most of the policies are now in force and effect. 	<ul style="list-style-type: none"> An EIS is required as development is proposed to occur within 120m of designated natural heritage features identified on Map 5 (Natural Heritage) of The London Plan, that include: <ul style="list-style-type: none"> Meadowily Woods Environmentally Significant Area
City of London Environmental Management Guidelines (AECOM 2021)	<ul style="list-style-type: none"> Outlines policy guidelines, standards, processes and procedures for the preparation and review of Environmental Impact Studies, determination of buffers and setbacks, and evaluation of significant woodlands as required by the province and the City of London. 	<ul style="list-style-type: none"> The EMG are 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 (2021)	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Although tree removals as a condition of Site Plan Application are exempt, the general protection outlined must still be considered. A tree inventory and Tree Protection Report must be completed.
O.Reg 41/24 Prohibited Activities, Exemptions, and Permits (Government of Ontario 2024)	<ul style="list-style-type: none"> O. Reg. 41/24 came into effect April 1, 2024 and supplements the existing Conservation Authorities Act (Government of Ontario 1990) to provide protections and exemptions to development within or adjacent to watercourses and/or wetlands. O. Reg 41/24 identifies constraints associated with wetlands, watercourses, and shorelines within the UTRCA jurisdiction. 	<ul style="list-style-type: none"> A portion of UTRCA Regulated Areas fall within the northern edge of the subject property and is associated with a small drainage feature located just north of the subject property. A small ravine is also present in the northwestern portion of the subject property and is associated with several drainage features located in the study area. This area is not shown on UTRCA regulated area mapping, but a slope stability assessment

Policy/Legislation/ Plan	Description	Project Relevance
		<p>was completed to evaluate the stable top of slope and necessary setback (EXP 2022b), which is to be reviewed by the UTRCA.</p> <ul style="list-style-type: none"> • Development, alteration, or interference with watercourses is prohibited within 15m of the stable top of bank of existing watercourses, subject to approval by the UTRCA. • The UTRCA may grant permission of development within regulated areas should it be shown that no impact will occur. An application for submission must be submitted to the relevant Conservation Authority prior to any approval for development within these regulated areas.

3.0 Field Methods

The scope of field surveys and methods to be implemented were determined in consultation with the City of London and UTRCA during a scoping meeting held on April 12, 2023. These surveys are detailed in an Environmental Study Scoping Checklist provided in Appendix I.

Terrestrial field surveys were undertaken within the subject property to characterize natural features and identify sensitive features and species that have the potential to be adversely affected by the proposed development. A total of 11 field visits were completed within the subject property between April and July 2023, as summarized in Table 2. The locations of monitoring stations are shown on Map 2. All surveys were undertaken in accordance with provincial and local guidance documents.

During the field work program, all observations of wildlife and flora were documented on all site visits. This included actual direct observations of individuals, as well as signs of wildlife presence (e.g., tracks, scat, dens, nest, etc.).

Table 2. Field Investigations Completed Within the Subject Property

Date (2023); Time	Tasks Completed	Protocol	Weather Conditions*	Field Staff
April 18; 11:00–17:20	Tree Inventory	N/A	1-2°C, 100% CC, wind 4, light snow	Shelby Hofstetter, Meagan Beck
	Bat Habitat Assessment	MECP 2022a MECP 2022b		
April 25; 11:30-13:30	Snake Emergence #1	Visual Encounter Surveys, systematic area search	10-12°C, 75-100% CC, wind 1-2, no precip.	Tara Sieg
	Significant Wildlife Habitat Assessment	MNRF 2017		
May 5; 11:10-12:50	Snake Emergence #2	Visual Encounter Surveys, systematic area search	13°C, 30-35% CC, wind 2, no precip.	Jake Nafziger
May 9; 9:40-11:50	Ecological Land Classification	Lee et al 1998		Pat Deacon, Meghan Douglas

Date (2023); Time	Tasks Completed	Protocol	Weather Conditions*	Field Staff
	Spring Vegetation Inventory	Systematic search by ELC polygon	12-15°C, 10-30% CC, wind 1-2, no precip.	
	Snake Emergence #3	Visual Encounter Surveys, systematic area search		
May 9; 9:00-17:15	Tree Inventory	N/A	16-18°C, 30% CC, wind 3, no precip.	Shelby Hofstetter, Meagan Beck
	Bat Habitat Assessment	MECP 2022a MECP 2022b		
June 1; 7:15-8:30	Breeding Bird Survey #1	OBBA 2021a, OBBA 2021b	17-20°C, 40% CC, wind 1, no precip.	Maria Alexandrou
June 20; 7:00-8:30	Breeding Bird Survey #2	OBBA 2021a, OBBA 2021b	18-19°C, 50-60% CC, wind 3, no precip.	Jake Nafziger
June 26; 21:00-21:30	Common Nighthawk Survey #1	Birds Canada 2021	22°C, 25% CC, wind 3, no precip.	Maria Alexandrou, Kirsten VanGoethem
July 10; 20:30-21:00	Common Nighthawk Survey #2	Birds Canada 2021	24°C, 0% CC, wind 3, no precip.	Kathryn Hoo, Kirsten VanGoethem
July 12; 9:00-16:00	Summer Vegetation Inventory	Systematic search by ELC polygon	16-24°C, 75% CC, wind 1-2, no precip.	Tara Seig
	Aquatic Habitat Assessment	Stanfield 2017		Emma Mardian
	Dripline Verification with City of London	N/A		Emma Mardian, Tara Sieg
July 17; 13:30-15:00	Butternut Health Assessment	MECP 2021	25°C, 100% CC, wind 3, no precip.	Sophia Munoz, Jake Nafziger

*Wind recorded using Beaufort Scale.

3.1 Terrestrial Field Surveys

3.1.1 Ecological Land Classification and Vegetation Inventories

Vegetation community delineation was completed using aerial photography and through a site investigation in the field on May 9, 2023. The standard Ecological Land Classification (ELC) System for southern Ontario was applied (Lee et al. 1998). Details of vegetation communities were recorded on data sheets including species composition, dominance, uncommon species or features, and evidence of human impact.

A two-season vascular flora inventory was conducted in the study area and all observed species of vascular flora were recorded during field surveys on May 9 and July 12, 2023. These survey dates correspond to the spring and summer based botanical inventories as identified in the Environmental Study Scoping Checklist (Appendix I).

3.1.2 Tree Inventory

A comprehensive tree inventory was completed by NRSI Certified Arborists on April 18 and May 9, 2023. Any trees within the footprint of the proposed development were identified and assessed as per the City of London's tree protection by-laws. Individual trees situated within the Municipal Road Right-of-Way (ROW) and ≥ 10 cm in Diameter at Breast Height (DBH) were assessed. The location of trees inventoried was subsequently surveyed using an SXBlue II GNSS GPS unit. The following information was recorded for each tree:

- species,
- DBH (cm),
- crown radius (metres),
- general health (excellent, good, fair, poor, very poor, snag),
- potential for structural failure (improbable, possible, probable, imminent),
- tree location (on-site/off-site), and
- general comments (i.e. disease, aesthetic quality, development constraints, sensitivity to development).

3.1.3 Butternut Health Assessment

A Butternut Health Assessment (BHA) was conducted on July 17, 2023 as per standard MECP protocol following the Butternut Assessment Guidelines (MECP 2021). Tissue samples were collected on July 17 from each Category 2 or 3 Butternut observed (three individuals) and sent

to NatureMetrics in Guelph, ON for DNA testing to determine hybridity according to the standardized sampling protocol.

3.1.4 Woodland Dripline Delineation

The driplines of the woodland and hedgerows along the northern and eastern boundaries of the subject property were delineated by a NRSI Certified Arborists during the completion of the tree inventory on April 18, 2023. The boundary was surveyed using a high accuracy (sub-metre) GPS unit and flagged in the field. A site meeting with City staff to review the delineated boundaries was completed on July 13, 2023. The woodland driplines were used to identify ecological buffers for the proposed development.

3.1.5 Bat Habitat Assessment

Habitats for candidate significant bat maternity colonies and habitat for bat SAR were identified based on criteria outlined in the Maternity Roost Survey Protocol (MECP 2022a), the *Bat Survey Standards Note* (MECP 2022b), and the Significant Wildlife Habitat Technical Guide (OMNR 2000). An assessment of trees within the subject property that may provide suitable habitat for SAR bats was completed in conjunction with the tree inventory on April 18 and May 9, 2023. This assessment focused on trees anticipated to be proposed for removal as part of the development, and data collected for each potential roost tree included tree species, DBH, decay class according to Watt and Caceres (1999), and the number, height, and type (e.g. cavity, crevice, sloughing bark) of suitable roost sites. The location of each potential roost tree was surveyed. This assessment was not completed for trees within the woodland along the northern boundary of the subject property, as these trees will be protected through the development process.

3.1.6 Breeding Bird Surveys

Two early-morning breeding bird surveys were carried out as per OBBA Survey Protocol (OBBA 2021a, OBBA 2021b). The breeding bird surveys were completed on June 1 and June 20, 2023 to fall within the peak nesting period which occurs between late May and early July in southern Ontario. Bird surveys involved the use of 10-minute point counts, as well as area searches throughout all habitats present within the subject property. Surveys were completed between a half-hour before sunrise and 4 hours after sunrise, and timed to occur at least 10 days apart. Three point-count stations were disbursed through the subject property and located a minimum of 200m apart, as well as placed to survey various habitats (Map 2). All visual and auditory observations of birds were recorded as well as the highest level of breeding evidence.

Observations of significant species were recorded in further detail, including their specific locations, behaviour, and highest level of breeding evidence.

3.1.7 Common Nighthawk Surveys

Two evening Common Nighthawk (*Chordeiles minor*) breeding surveys were conducted on June 26 and July 10, 2023, following the Ontario Breeding Bird Atlas: Ontario Nightjar Survey Instructional Manual (Hannah 2021). Common Nighthawk surveys consisted of 6-minute point counts, completed where potential Common Nighthawk habitat was identified within the subject property. Two point-count stations were selected (Map 2). Common Nighthawk surveys occurred in the evenings beginning no earlier than 30 minutes prior to sunset and to no later than one hour after sunset. All birds observed, as well as the highest level of breeding evidence exhibited for each species, were recorded by an avian biologist.

3.1.8 Snake Emergence Surveys

Due to the presence of old foundations, a sealed well, and rubble piles within the residential polygon, 3 rounds of snake emergence surveys were completed in the spring of 2023 on April 25, May 5, and May 9. Visual encounter surveys were completed using systematic area searches of habitat around the candidate snake hibernacula. Detailed notes were taken on the hibernacula features, as well as any snakes that were encountered including exact locations, number of individuals, sex, age, and behaviour.

3.1.9 Habitat Assessments and Documentation of Other Wildlife

Any features of wildlife habitat observed by NRSI biologists within the study area that may be indicative of SWH or habitat for SAR were documented in detail, photographed, and georeferenced using a hand-held GPS unit. Incidental observations of all wildlife were recorded while on-site. In addition to direct observations, evidence such as dens, tracks, and scat were documented.

3.2 Aquatic Surveys

3.2.1 Aquatic Habitat Assessment

Drainage and watercourse features within the study area were mapped and characterized by NRSI biologists on July 12, 2023, including channel dimensions, bank characteristics, substrate composition, habitat types, fish cover features (undercut banks, overhanging vegetation, etc.), water depth, and riparian vegetation. The characterization of drainage features and

watercourses was conducted in accordance with the Ontario Stream Assessment Protocol (Stanfield 2017).

4.0 Existing Conditions

4.1 Soil, Terrain and Drainage

The subject property lies within the Upper Thames River watershed, which falls under the jurisdiction of the UTRCA. The Upper Thames watershed is 3,420km² and contains 28 subwatersheds. The subject property is entirely located within the Dorchester Corridor Subwatershed. This subwatershed contains areas that are considered significant groundwater recharge areas and highly vulnerable aquifers. Significant groundwater recharge areas and highly vulnerable areas are identified within the study area and have been mapped within the subject property (UTRCA 2021).

A topographic survey of the subject property was completed by Callon Dietz Land Surveying Ontario Inc. in March 2023. This topographic survey found that the majority of the subject property is fairly flat and slopes gradually to the northern property boundary and the Meadowlily Woods ESA. Drainage within the western half of the subject property generally flows to the northwestern boundary of the property where three drainage features are present. Drainage from the eastern half of the subject property flows north towards Meadowlily Woods ESA where two small drainage features are present beyond the northern property boundary. A steep slope and small ravine are present in the northwest corner of the subject property. EXP Services Inc. completed a slope stability assessment for the area of the subject property in October 2022 (EXP 2022b). The assessment identified the top of slope, toe of slope, stable slope setback, and erosion hazard limit. The erosion hazard limit is the outermost constraint line (extending farthest south into the subject property) and is largely coincident with the edge of the woodland dripline.

The subject property is located in the Physiographic Region known as the Mount Elgin Ridges (Chapman and Putnam 1984). The Soils of Middlesex County (Hagerty and Kingston 1992) states that soils within the City of London have been extensively disturbed, and as such have not been mapped. A Hydrogeological Report was prepared by EXP Services Inc. in October 2022, which identifies that the subject property is located within a till moraine and is in an area that can be characterized by glaciofluvial outwash deposits of gravel and sand, with the surficial geology of the site consisting primarily of clay to silt-textured till. Drilling within the site identified the presence of clayey silt/silty clay till subgrade soils, resulting in minor seepage to the subsurface and overland flows in low portions of the site. Infiltration of groundwater is limited to pockets with higher sand content within the subject property. The Hydrogeological Report

identifies that surficial soils have low permeability and that the site should not be considered within a Significant Groundwater Recharge Area (EXP 2022a).

4.2 Designated Natural Areas

According to The London Plan (City of London 2023), Meadowlily Woods is designated as an Environmentally Significant Area (ESA). ESAs are large natural areas that contain natural features and perform ecological functions that warrant their retention in a natural state (City of London 2023). Although these areas are protected as the Green Space Place Type in the London Plan, additional measures to provide for their protection, management and use by the public are necessary. ESAs within the City of London are identified based on criteria in the City of London EMG (AECOM 2021).

The Meadowlily Woods ESA is situated to the north and south of the south branch of the Thames River, east of Highbury Avenue. The most recent boundaries of the ESA are shown in the Meadowlily Woods ESA CMP (NRSI 2019). The Meadowlily Woods ESA contains mature woodlands, ravines and floodplain woods which are an excellent representation of pre-settlement conditions in the City of London. The ESA is comprised of public and private lands, including lands owned by the City of London, Thames Talbot Land Trust, and private landowners. The portion of the ESA located along the northern edge of the subject property is owned and managed by the City of London. This portion of the Meadowlily Woods ESA comprises Park Farm which is identified as a Cultural Heritage Zone in the Meadowlily Woods ESA CMP (NRSI 2019). Meadowlily Woods provides habitat for a wide variety of plant and animal species, including rare and provincially significant species.

4.3 Vegetation

4.3.1 Vegetation Communities

The subject property consists primarily of an agricultural field that is bordered to the north by deciduous forest, cultural savannah and hedgerow, and bordered to the east by another hedgerow. The subject property also contains a small unmaintained former residential area where the foundations of a few buildings remain. ELC vegetation communities delineated within the subject property and adjacent lands are described in Table 3 and presented on Map 3.

Table 3. Vegetation Communities Identified within the Subject Property

ELC Ecosite Type	ELC Description	Environmental Characteristics
Cultural		
Ag	Agricultural	An active agricultural field that occupies the majority of the subject property. The community consists of row crop. The crop was corn in 2023.
CUS1	Mineral Cultural Savannah	A young treed community present along the northern property boundary and associated with Park Farm. <u>Canopy:</u> Black Walnut (<i>Juglans nigra</i>), Common Hackberry (<i>Celtis occidentalis</i>) <u>Sub-canopy:</u> Hawthorn species (<i>Crataegus sp.</i>), American Basswood (<i>Tilia americana</i>), Black Walnut <u>Understorey:</u> Black Walnut, European Buckthorn <u>Groundcover:</u> Kentucky Bluegrass (<i>Poa pratensis</i>), Smooth Brome (<i>Bromus inermis</i>)
Res	Residential	A small community central to the subject and bordering Commissioners Road East, this is a cultural community with foundations remaining from the former residence, a capped well, and rubble piles. There are more recent signs of disturbance including dumping of household waste. Trees within this community are planted and predominantly deciduous. <u>Canopy:</u> Black Walnut, Norway Spruce (<i>Picea abies</i>) <u>Sub-canopy:</u> Black Walnut, Common Pear (<i>Pyrus communis</i>) <u>Understorey:</u> Black Walnut, European Buckthorn (<i>Rhamnus cathartica</i>) <u>Groundcover:</u> Kentucky Bluegrass, Smooth Brome
Hedgerow	Hedgerow	The hedgerow along both the northern and eastern property boundaries is comprised of the same species with low diversity and areas of locally common invasive shrubs present. <u>Canopy:</u> Black Walnut, Common Hackberry <u>Sub-canopy:</u> Hawthorn species, American Basswood, Black Walnut <u>Understorey:</u> Black Walnut, European Buckthorn, Black Raspberry (<i>Rubus occidentalis</i>) <u>Groundcover:</u> Tall Goldenrod (<i>Solidago gigantea</i>), Smooth Brome, Kentucky Bluegrass Four Butternuts (<i>Juglans cinerea</i>) are located within the hedgerow along the eastern edge of the property.
Forest		
FOD5-1	Dry - Fresh Sugar Maple Deciduous Forest Type	Mature Maple dominated deciduous forest located along the northwest portion of the subject property. Two eroding ravines converge within this community along the northern property line. <u>Canopy:</u> Sugar Maple (<i>Acer saccharum</i>), Black Walnut <u>Sub-canopy:</u> Sugar Maple, Black Locust (<i>Robinia pseudoacacia</i>)

ELC Ecosite Type	ELC Description	Environmental Characteristics
		<u>Understorey:</u> Chokecherry (<i>Prunus virginiana</i>), European Buckthorn, Alternate Dogwood (<i>Cornus alternifolia</i>) <u>Groundcover:</u> Avens sp. (<i>Geum sp.</i>), Garlic Mustard (<i>Alliaria petiolata</i>), Sedge sp. (<i>Carex sp.</i>), Yellow Trout Lily (<i>Erythronium americanum</i>)
FOD5-2	Dry - Fresh Sugar Maple - Beech Deciduous Forest Type	<p>This feature is located to the northeast of the subject property, within the study area. It was not formally surveyed by NRSI in 2023; however, background information was taken from the Meadowlily Woods ESA CMP (NRSI 2019). It is a mature, rolling upland, deciduous forest community.</p> <p><u>Canopy:</u> Sugar Maple, American Beech (<i>Fagus grandifolia</i>) <u>Sub-canopy:</u> Sugar Maple, American Beech <u>Understorey:</u> Eastern Hop-hornbeam (<i>Ostrya virginiana</i>), Choke Cherry (<i>Prunus virginiana</i>), Sugar Maple <u>Groundcover:</u> Choke Cherry, Trout-Lily (<i>Erythronium spp.</i>), False Solomon's Seal (<i>Maianthemum racemosum</i>), Common Blue Violet (<i>Viola sororia</i>)</p>

4.3.2 Vascular Flora

Detailed vegetation inventories were conducted during two-season (i.e., spring and summer) surveys, with 90 species recorded. A complete list of these species is appended to this report (Appendix IV). Approximately 48% of the vascular plant species observed are species that are not native to Ontario.

Background information and the SAR and SCC screening indicate that 10 significant plant species have been reported from within 1km of the study area. Of these species, 7 were determined to have potentially suitable habitat within the subject property, primarily within forest communities along the northern property boundary. The screening exercise assisted in determining species to be targeted during the vascular flora inventories. NRSI observed only one of these species within the subject property: Butternut, which is an endangered tree species.

Butternut

A total of four Butternut trees were identified from the subject property and adjacent lands within 50m. Butternut is listed as Endangered, both federally and provincially, and the species' habitat is protected under the Endangered Species Act, 2007. A Butternut Health Assessment (BHA) was completed for each Butternut identified within the search area, in accordance with MECP protocol (MECP 2021). Results of the BHAs and genetic testing are presented in Table 4

below. One tree was assessed as a Category 1 tree, two were assessed at Category 2, and one was assessed as Category 3.

Genetic analysis was completed for leaf tissue samples collected from the 3 Butternuts that were assessed as Category 2 and 3. Results of the genetic analysis concluded that all three of these trees are genetically pure Butternuts.

Table 4. Results of Butternut Health Assessments and Genetic Testing

Butternut ID	Location (UTM; Zone 17T)	DBH (cm)	BHA Category	Genetic Testing Results
JUG-001	485242 4756882	21	2 (retainable)	Butternut
JUG-002	485248 4756892	30	3 (archivable)	Butternut
JUG-003	485244 4756926	17	2 (retainable)	Butternut
JUG-004	485240 4756924	8	1 (advanced disease)	N/A

4.3.3 Tree Inventory

In total, 183 trees, comprising 21 species, were inventoried from the subject property. Of the trees inventoried and assessed, 154 (84%) are native species and 29 (16%) are non-native species. The subject property is not located within the City’s Tree Protection Area. A complete list of trees inventoried is provided in Appendix V.

Table 5 provides a list of tree species inventoried within the subject property, whether they are native or non-native, and their overall health.

Table 5. Summary of Inventoried Trees Within the Subject Property

Common Name	Scientific Name	Excellent	Good	Fair	Poor	Very Poor	Dead	Total
Native Species								
American Basswood	<i>Tilia americana</i>		1	4				5
American Elm	<i>Ulmus americana</i>			1			2	3
Bitternut Hickory	<i>Carya cordiformis</i>		2	25	7	1	1	36
Black Cherry	<i>Prunus serotina</i>			3	1			4
Black Walnut	<i>Juglans nigra</i>		1	52	3			56
Butternut	<i>Juglans cinerea</i>			3	1			4
Common Hackberry	<i>Celtis occidentalis</i>			5		1		6
Eastern Cottonwood	<i>Populus deltoides</i>			1				1
Green Ash	<i>Fraxinus pennsylvanica</i>			1		3	1	5
Hawthorne species	<i>Crataegus sp.</i>			7		2		9

Common Name	Scientific Name	Excellent	Good	Fair	Poor	Very Poor	Dead	Total
Manitoba Maple	<i>Acer negundo</i>			4				4
Slippery Elm	<i>Ulmus rubra</i>			3				3
Sugar Maple	<i>Acer saccharum</i>		1	10				11
Trembling Aspen	<i>Populus tremuloides</i>			3				3
White Spruce	<i>Picea glauca</i>			3	1			4
Total		0	5	125	13	7	4	154
Non-Native Species								
Black Locust	<i>Robinia pseudoacacia</i>			16				16
Blue Spruce	<i>Picea pungens</i>			3				3
Common Pear	<i>Pyrus communis</i>				1			1
Crimson King Norway Maple	<i>Acer platanoides</i> 'Crimson King'			2				2
Norway Spruce	<i>Picea abies</i>		2					2
Sweet Cherry	<i>Prunus avium</i>			4	1			5
Total		0	2	25	2	0	0	29
Overall Total		0	7	150	15	7		183

Table 6 provides a summary of the overall health of trees inventoried within the subject property, along with their potential for structural failure. The majority of trees inventoried are in fair health with an improbable potential for structural failure.

Table 6. Overall Health of Trees Inventoried

Potential for Structural Failure Rating	Overall Condition						Total
	Excellent	Good	Fair	Poor	Very Poor	Dead	
Improbable	0	7	130	1	0	0	138
Possible	0	0	20	16	5	3	44
Probable	0	0	0	0	0	1	1
Imminent	0	0	0	0	0	0	0
Total	0	7	150	17	5	4	183

4.4 Wildlife

4.4.1 Birds

A total of 185 bird species are reported from the vicinity of the study area based on the OBBA (BSC et al. 2008), the NHIC database (MNR 2022), eBird data (eBird 2022), and background information in the Meadowlily Woods ESA CMP (NRSI 2019). The data reported in the OBBA includes those species that have been observed in the area (10x10km range), are known to nest in the area, and/or have exhibited some evidence of breeding in the area. The NHIC

results are based on 1x1km squares. The eBird results include all species recorded from the hotspot “London--Meadowlily Woods Park”.

NRSI avian specialists observed a total of 47 species within the study area during breeding bird surveys and incidentally during other field studies. Of the birds observed, 32 exhibited signs of breeding. Six species were ‘Confirmed’ to be breeding on the subject property, 13 species showed signs of ‘Probable’ breeding, and 13 species were considered to be ‘Possible’ breeders within the study area. Refer to Appendix VI for a complete list of bird species reported from the study area.

Background information and the SAR and SCC screening indicate that 23 significant bird species have been reported from the vicinity of the study area. NRSI observed three of these significant species during field surveys: Barn Swallow (*Hirundo rustica*), Eastern Wood-Pewee (*Contopus virens*), and Eastern Meadowlark (*Sturnella magna*).

Barn Swallow

Barn Swallow is listed as Threatened federally (under consideration for status change) and Special Concern provincially (Government of Canada 2023, MECP 2024). NRSI avian specialists observed a total of 5 Barn Swallows during the first round of breeding bird surveys while completing the area search of the agricultural field on the subject property. Barn Swallows were also observed during the second round of breeding bird surveys, with 3 recorded from BMB-001 and 2 recorded feeding over the agricultural field during the area search. The Barn Swallows observed during these surveys were considered to be ‘Possibly’ breeding based on the potential presence of suitable nesting structures within the study area boundaries. No structures are present on the subject property itself that would provide suitable nesting habitat for this species. One other incidental observation of Barn Swallow occurred during a site visit on May 5, 2023, outside of the breeding bird survey window. Habitat for Barn Swallow within the subject property is limited to low quality foraging habitat over the agricultural fields. Since suitable nesting habitat for the species is not present within the subject property, Barn Swallow is not discussed further in this report. All observations of Barn Swallow made by NRSI are shown on Map 3.

Eastern Wood-Pewee

Eastern Wood-Pewee, listed as Special Concern federally and provincially (Government of Canada 2023, MECP 2024), was observed during the breeding bird survey completed on June

1, 2023. This observation consisted of a single bird singing from within the FOD5-1 community while completing an area search of the subject property. No further observations of Eastern Wood-Pewee were made during the second round of surveys or other site visits. Eastern Wood-Pewee was determined to be 'Possibly' breeding based on the presence of a singing male. The location of the Eastern Wood-Pewee observation is shown on Map 3. Further discussion addressing this habitat for Eastern Wood-Pewee as SWH is provided in Section 5.

Eastern Meadowlark

A single Eastern Meadowlark, listed as Threatened federally and provincially (Government of Canada 2023, MECP 2024), was observed during the breeding bird survey completed on June 1, 2023. The observation was made outside the subject property but within the 120m buffer study area boundary. Eastern Meadowlark was determined to be 'Possibly' breeding in the study area based on the presence of suitable breeding habitat in the northwest corner of the study area on the west side of Meadowlily Road South where the individual was observed. Suitable breeding habitat for this species is not present within the subject property itself. The location of the Eastern Meadowlark observation is shown on Map 3.

4.4.2 Herpetofauna

According to the Ontario Reptile and Amphibian Atlas (Ontario Nature 2019) and the NHIC database (MNRF 2022), 24 species of herpetofauna are reported from within 10km of the subject property. Two species of herpetofauna were observed on the subject property during field surveys in 2023. An American Toad (*Anaxyrus americanus*) was observed during a site visit on July 10, 2023. Three rounds of snake emergence surveys were completed, yielding a total of three Eastern Gartersnake (*Thamnophis sirtalis sirtalis*) observations; two on May 5, and one on May 9, 2023. A complete list of herpetofauna reported from the study area is included in Appendix VII.

Background information and the SAR and SCC screening indicate that 6 significant amphibian and reptile species have been reported from the vicinity of the study area. No significant herpetofauna species were observed during field surveys conducted by NRSI.

4.4.3 Mammals

According to the Mammal Atlas of Ontario (Dobbyn 1994) and the NHIC database (MNRF 2022), 45 mammal species are reported from within 10km of the subject property. During the course of all field surveys, 5 of these species or evidence of their presence (i.e. tracks, scat,

dens) were observed by NRSI biologists within the subject property. A complete list of mammals reported from the study area is provided in Appendix VIII.

Background information and the SAR and SCC screening indicate that 5 significant mammal species have been reported from the vicinity of the study area; however, no significant mammal species were observed during NRSI field studies. SAR bats may be present within the study area. Eastern Red Bat (*Lasiurus borealis*), Hoary Bat (*Lasiurus cinereus*), and Silver-haired Bat (*Lasionycteris noctivagans*) have newly been assessed as Endangered by the Committee on the Status of Species at Risk in Ontario (COSSARO) and will be protected by the Endangered Species Act as of January 31, 2025. These species are also possible within the study area and subject property.

Bat Habitat Assessment

During the tree inventory conducted on April 18 and May 9, 2023, all trees within and adjacent to the subject property that may require removal for the proposed development were assessed for their potential to provide suitable habitat for roosting bats. During the assessment, three trees were identified from the subject property that contain cavities which may provide suitable roost habitat for bats, including Little Brown Myotis (*Myotis lucifugus*) and Northern Myotis (*Myotis septentrionalis*) which are both SAR. The candidate bat roost trees are summarized in Table 7 and their locations are shown on Map 3.

Table 7. Summary of Bat Cavity Trees

Tree ID	Tree Species	DBH (cm)	Roost Feature
BCT-001	Slippery Elm (<i>Ulmus rubra</i>)	84	Knotholes (2) at 6 m and 7m
BCT-002	Black Walnut (<i>Juglans nigra</i>)	55	Cavity at 4 m
BCT-003	American Basswood (<i>Tilia americana</i>)	38+14+12	Cavity at 1.5 m

4.4.4 Butterflies

According to the Ontario Butterfly Atlas (MacNaughton et al. 2022), 42 butterfly species have been reported from the vicinity of the study area. NRSI biologists observed two butterfly species during surveys completed within the subject property. A complete list of butterfly species reported from the study area is provided in Appendix IX.

Background information and the SAR and SCC screening indicate that two significant butterfly species are reported from the vicinity of the study area. NRSI observed one of these significant species, Monarch (*Danaus plexippus*), during field surveys.

Monarch

A single Monarch, listed as Endangered federally and Special Concern provincially (Government of Canada 2023, MECP 2024), was observed during the site visit on July 12, 2023. The Monarch was observed flying along the northern property boundary, along the margin of the hedgerow and agricultural field. Suitable habitat for Monarch breeding and rearing of larvae is not present within the subject property. This species requires abundant sources of Milkweed (*Asclepias* spp.) for their larvae to feed on. Although Common Milkweed (*Asclepias syriaca*) was observed during vegetation inventories conducted within the subject property, it was only occasionally observed along the margins of the hedgerows and within the former residential lot. Since high quality habitat for Monarch is not present within the subject property, this species is not discussed further in this report. The location of the Monarch observation is shown on Map 3.

4.4.5 Odonata

According to the Ontario Odonata Atlas (OOAD 2022), 52 odonata species are reported from the vicinity of the study area. NRSI biologists observed no odonata during surveys completed within the subject property. A complete list of odonate species reported from the study area is provided in Appendix X.

Background information and SAR and SCC screening indicated that 1 significant odonate species has been reported from the vicinity of the study area (OOAD 2022). Potential habitat for this species, Slender Bluet (*Enallagma traviatum*), is not present in the vicinity of the study area.

4.5 Aquatic Habitat

An assessment of aquatic habitat within the subject property was conducted on July 12, 2023. This assessment focused on drainage features that are known from the northern edge of the subject property and in the Meadowlily Woods ESA, within the study area. Each drainage feature was divided into sections and characterized, the location of each feature and the associated sections are shown on Map 4. A total of nine drainage features were surveyed within the study area. None of the drainage features were found to provide direct or indirect fish habitat and the Meadowlily Woods ESA CMP identifies barriers to fish movement between the South Thames River and the ravines containing the drainage features (NRSI 2019).

Drainage Feature A

Drainage feature A is located approximately 20m north of the northeastern corner of the subject property boundary. The feature starts along the northern edge of the hedgerow. Feature A is described as the upstream extent of a Headwater Drainage Feature (HDF). The feature has been divided into three sections (1, 2, and 3). Water from the agricultural field north of the subject property, associated with Park Farm within the Meadowlily Woods ESA, is conveyed to the feature and flows north before turning west and joining with Drainage Feature C. During the field survey, minimal water was present within this drainage feature; the water that was present was likely a result of a rain event the previous night. No evidence of longstanding water was observed and grasses were present within much of the channel. Section 1 of the feature is a narrow, 30cm wide, drainage channel. Soils were observed to be wet in this section, but no standing water was present. Section 2 of the feature is coincident with a narrow walking trail. The feature was dry and was not at all channelized; it is being used as a walking trail. Section 3 of the feature is located within a cultural meadow community and consists of a 15cm wide channel that was also dry.

Drainage Feature B

Drainage feature B is located approximately 16m north of the subject property boundary, within the agricultural field associated with Park Farm. The feature starts along the northern edge of the hedgerow in this portion of the study area. Feature B is the upstream extent of an HDF. The feature has been divided into four sections (4, 5, 6, and 7). The southern extent of the feature conveys water from the surrounding agricultural field, while the northern portion of the feature conveys water from a narrow cultural meadow community. Water within the drainage feature flows north before bearing slightly northwest and joining with drainage feature C. During the field survey, minimal water was present within this drainage feature. Water in the drainage channel was approximately 1cm deep in the northern extent of the feature and 15cm deep in a pool at the southern extent. It is expected that water that was observed was the result of a rain event the night prior. Reed Canary Grass (*Phalaris arundinacea*) was observed in the feature within the cultural meadow, since this species favours wet environments, it is an indicator that feature B is wet in the spring. Section 4 of the feature had a wetted width of 10cm and contained 1cm of water during the survey, the bankfull width of the main channel was 30cm wide and 20cm deep. Section 5 of the feature is located within a narrow projection of the cultural meadow that extends into the agricultural fields associated with Park Farm. A small 15cm deep pool of water was noted in this section. Section 6 of the feature consists of a wet

agricultural field with no channel noted. Section 7 is a narrow 15cm wide channel and was observed to have wet soil, but no standing water.

Drainage Feature C

Drainage feature C is located well outside the subject property, approximately 110m north of the boundary. This feature conveys water from drainage features A and B. Two gullies are present along the southeastern extent of the features A and B, which then meet to form a single channel that conveys water northwest towards the South Thames River. The feature has been divided into three sections (8, 9, and 10). Section 8 conveys water from feature B, a gully within this section has a bank height of 80cm and a bank width of 110cm. Section 8 is connected to feature B by a narrow channel with minimal water flow. It was noted to have a water depth of 13cm, a wetted width of 28cm, and a bankfull width of 50cm. Section 9 conveys water from drainage feature A, a gully along this section has a bank height of 200cm and a bank width of 350cm. At the confluence of sections 8 and 9, the bank height was recorded as approximately 300cm. Section 10 of the feature extends west from the confluence; it consists of a channel with minimal water flow and was comprised mainly of small pools. The channel bed was characterized as 75% clay, 15% gravel, and 10% pebble. The northern extent of Section 10 consisted of a pool with a water depth of 5cm, a wetted width of 60cm and a bankfull width of 220cm.

Drainage Feature D

Drainage feature D is located approximately 100m north of the subject property boundary, within the Park Farm area and a cultural woodland. Feature D is the upstream extent of an HDF that conveys water from the adjacent agricultural field. The feature consists of a single section (12). During the field survey minimal water flow was observed within the feature. Section 12 consists of a drainage channel with an average wetted width of 25cm, average bankfull width of 230cm, and water depths between 1cm and 5cm. The feature was well shaded and the riparian zone consisted of woodland shrubs. The channel bed was characterized as 50% silt, 38% clay, 10% cobble, and 2% boulder.

Drainage Feature E

Drainage feature E is located approximately 150m north of the subject property boundary, outside of the study area. This feature is an HDF that conveys flows from features A, B, C, and D, it flows through a cultural woodland, cultural meadow, and deciduous forest. It was assessed to the point where a small pedestrian bridge associated with the trail crosses the feature. A

single section was identified for the drainage feature (section 11). During the survey, minimal water flows were observed and flows had ceased completely by the trail. The channel had average wetted width of 50cm, a bankfull width of 200cm and a water depth between 1cm and 8cm. During the spring, this feature may provide indirect contributions to fish habitat associated with the South Thames River.

Drainage Feature F

Drainage feature F is the easternmost feature associated with a small cluster of drainage features in the northwestern portion of the subject property. The feature starts within the FOD5-1 community within the subject property. It is the upstream extent of an HDF that conveys water from the agricultural field within the subject property and the FOD5-1 community. Feature F consists of a single section (13). During the survey, minimal water was present within the feature. The channel has an average wetted width of 50cm, a bankfull width of 180cm, and a water depth between 0.5cm and 7cm. The riparian zone of the feature consists of understory plants and European Buckthorn. The channel bed was characterized as 50% silt, 40% clay, and 10% cobble.

Drainage Feature G

Drainage feature G is the central feature associated with a small cluster on drainage features in the northwestern portion of the subject property. The feature starts within the FOD5-1 community within the subject property. It is the upstream extent of an HDF that conveys water from the agricultural field within the subject property and the FOD5-1 community. Feature G consists of a single section (14). During the survey, minimal water was present within the feature. The channel has an average wetted width of 70cm, a bankfull width of 240cm, and a water depth between 1cm and 6.5cm. The channel bed was characterized as 50% silt, 38% clay, 10% cobble, and 2% boulder.

Drainage Feature H

Drainage feature H is the westernmost feature associated with a small cluster on drainage features in the northwestern portion of the subject property. The feature starts within the FOD5-1 community within the subject property. It is the upstream extent of an HDF that conveys water from the agricultural field within the subject property and the FOD5-1 community. Feature H consists of a single section (16). During the survey, minimal water was present within the feature. The channel has an average wetted width of 70cm, a bankfull width of 240cm, and a water depth between 1cm and 6.5cm. The riparian zone of the feature consists of woodland

shrubs. The channel bed was characterized as 50% silt, 40% clay, and 10% cobble. Dumping of garbage was noted within the feature.

Drainage Feature I

Drainage feature I conveys water from features F, G, and H, and consists of two sections (15 and 17). The feature starts within the FOD5-1 community to the immediate north of the subject property. The upstream portion of the feature, the confluence of features F and G, has a valley width of 5m, and a bank height between 2m and 3m. At the confluence with feature H the valley bank has a width of 8m and a height of 2.5m. Feature I passes through a 80cm diameter CSP culvert that runs beneath the driveway into Park Farm and ends at a concrete headwall with a plastic culvert that runs beneath Meadowlily Road. Minimal water was present within the feature during the field survey. The riparian zone of the feature is comprised of woodland shrubs and is well shaded. The channel bed was characterized as 70% silt and 30% sand. Eastern Skunk Cabbage (*Symplocarpus foetidus*) a plant species that indicates groundwater influence was noted along section 15 of this drainage feature.

5.0 Significance and Sensitivity of Natural Features

A natural environment analysis is undertaken to identify natural features that are sensitive to disturbance based on the rarity or significance of the feature or its functions, as well as policies prohibiting development within them. These areas are identified as “constraints” and are discussed in the context of natural heritage policies governing their protection. Conversely, opportunities for development may occur outside of these natural environment constraints within the study area. Results of this analysis have been provided as input to the proposed development plan in order to avoid and reduce impacts to natural features and functions. A summary of this analysis for the study area is discussed below.

5.1 Significant Woodlands

The Meadowlily Woods ESA is present along the northern subject property boundary. As per the Meadowlily Woods ESA CMP (NRSI 2019) and the City of London EMG (AECOM 2021), the woodlands within the ESA meet the criteria for significance. The woodland dripline for the ESA along the northern edge of the subject property was surveyed with the City of London on July 12, 2023. The CUS1 community along the northern subject property boundary has been included as part of the Significant Woodland in accordance with Section 3.1 of the EMG (AECOM 2021) which identifies cultural savannahs as potential woodland components. The cultural savannah within the study area fills a bay within the greater vegetation patch and should be considered part of the Significant Woodland as a whole as per Section 4.8, Guideline 6, within the EMG (AECOM 2021). The hedgerow that extends east of the CUS1 community has been included as part of the Significant Woodland patch since it provides a linkage between the FOD5-2 community east of the hedgerow and the CUS1/FOD5-1 communities west of the hedgerow. This is recommended in accordance with Section 4.8, Guideline 3, of the EMG (AECOM 2021). The woodland dripline is presented on Maps 3 and 5.

As described in the Meadowlily Woods ESA CMP (NRSI 2019), the hedgerow that runs along the eastern boundary of the subject property is not included within the boundary of the ESA. This determination was further supported by fieldwork conducted by NRSI in 2023. As per Section 4.8, Guideline 3, of the City of London EMG (AECOM 2021), vegetation projections that are less than 30m wide should only be included within the boundary of a natural feature if the projection includes a wooded ravine or valley or if it provides a linkage within the landscape. Since the hedgerow does not meet these criteria, the hedgerow is not included in the boundary of the ESA and is therefore not a significant feature.

5.2 Environmentally Significant Areas

The City of London recognizes ESAs, which are shown on Map 5 (Natural Heritage) of The London Plan (2023). The Meadowlily Woods ESA is located north of the subject property and partially overlaps the subject lands along the northern edge. The ESA boundary as it relates to the subject property is shown on Maps 1 and 3. The boundary of the Meadowlily Woods ESA has been refined along the northern boundary of the subject property to coincide with the surveyed dripline (Map 5).

5.3 Significant Wildlife Habitat

Based on field surveys, one SWH type has been confirmed within the subject property and study area: Special Concern and Rare Wildlife Species Habitat for Eastern Wood-Pewee. One SWH type has been identified as candidate for the study area: Bat Maternity Colony. Full results of the SWH assessment are provided below and in Appendix III.

5.3.1 Seasonal Concentration Areas

Wildlife seasonal concentration areas are defined as areas where animals occur in relatively high densities for all, or portions, or their life cycle (OMNR 2000). These areas are typically small in size, particularly when compared to areas used by these species during other times of the year.

Bat Maternity Colonies - Candidate

Potential habitat for bat maternity colonies has been identified within the FOD5-1 and FOD5-2 communities of the Meadowlily Woods ESA. This SWH partially overlaps the northwestern edge of the subject property where the FOD5-1 community is present. These woodlands contain trees that could may provide suitable cavities for bat maternity colonies. A fulsome bat habitat assessment was not completed in this portion of the study area as development is not proposed for any portion of the FOD5-1 or FOD5-2 communities, and therefore no impact to candidate bat maternity colony SWH is anticipated. The extent of potential candidate bat maternity colony habitat is shown on Map 5.

5.3.2 Habitat for Species of Conservation Concern

Species of Conservation Concern are species with a provincial S-rank of S1 to S3, species listed as species of Special Concern provincially, or species listed as Endangered or Threatened federally with no provincial designation. Confirmed habitat for SCC may be considered SWH (OMNR 2000). Habitat for one SCC is present within the subject property

and/or study area, based on the completion of original field surveys by NRSI for the SLSR and EIS.

Special Concern and Rare Wildlife Species (Eastern Wood-Pewee)

The Meadowlily Woods ESA CMP (NRSI 2019) identified habitat for Eastern Wood-Pewee within the FOD5-1 and FOD5-2 communities located adjacent to and partially within the northern edge of the subject property. Eastern Wood-Pewee was confirmed from the FOD5-1 woodland through breeding bird surveys in 2023 as a 'Possible' breeder.

Eastern Wood-Pewee is a habitat generalist and will breed in most deciduous, mixed or coniferous woodlands with trees of a suitable size. The hedgerow community along the northern and eastern edges of the subject property is not considered to be SWH as it is a young feature and no Eastern Wood-Pewee were observed to be using the hedgerow. As a result of the detailed field surveys conducted within the subject property, SWH for Eastern Wood-Pewee has been refined from the Meadowlily Woods ESA CMP (NRSI 2019) to include only the FOD5-1 and FOD5-2 communities within the subject property and study area. SWH for Eastern Wood-Pewee within the subject property and study area is shown on Map 5.

5.4 Habitat of Endangered and Threatened Species

Based on the background information review and field investigations, two regulated SAR (Butternut and Eastern Meadowlark) and potential habitat for SAR bat species were documented within the study area.

5.4.1 Butternut

Butternut is listed as Endangered both provincially and federally (MECP 2024, Government of Canada 2023). The species is listed as Endangered due to rapid population declines occurring as the result of a fungus called Butternut Canker (*Sirococcus clavigignenti-juglandacearum*). Butternut receives regulated habitat protection under the Endangered Species Act, 2007. Regulated habitat is the area prescribed for a species in a habitat regulation, Ontario Regulation 830/21. With regards to Butternut, all suitable areas within 50m of an individual Butternut tree are protected under the Endangered Species Act.

If a proposed development or site alteration may result in harming or killing a Butternut, the proposed works will require a permit or authorization under the ESA to proceed. Harming or killing an individual applies to not only direct impacts to the tree, but also impacts to the habitat, including within 50m of an individual. Some proposed activities that will result in impacts to

Butternut may be eligible for conditional exemptions under Ontario Regulation 242/08 or Ontario Regulation 830/21. These exemptions apply to those activities that propose to kill (i.e., remove) or harm trees that are in advanced stages of disease (Category 1), or up to a maximum of 15 Category 2 and up to a maximum of 5 Category 3 trees as identified during a BHA.

Confirmed habitat for Butternut exists within and adjacent to the subject property. A BHA was completed for each individual documented and summarized in a BHA report which is to be submitted to the MECP 30 days prior to the start of proposed work on the subject property. The results of the BHA are considered final 30 days following the submission of the report to the MECP.

A total of four Butternuts were observed within and adjacent to the subject property in the eastern hedgerow (Map 3). Of the four trees observed, one (JUG-004) was determined through the BHA to be a Category 1 tree and is therefore exempt from protections under the Endangered Species Act, as per O. Reg 242/08 Section 23.7. Of the three remaining Butternuts, JUG-001 and JUG-003 were determined to be Category 2 (retainable), and the third (JUG-002) was determined to be Category 3 (archivable). Different zones around each tree requires consideration. The Root Harm Prevention Zone (RHPZ) based on the current DBH of each Butternut, as well as the 5m RHPZ buffer, 25m and 50m habitat zones for each Butternut are shown on Map 5.

5.4.2 Eastern Meadowlark

A single Eastern Meadowlark was observed with 'Possible' breeding evidence within the study area, northwest of the subject property, during the breeding bird survey conducted June 1, 2023 (Map 3). Eastern Meadowlark predominantly breeds in native grasslands, pastures, savannas, hay and alfalfa fields, weedy borders of croplands, roadsides, orchards, and shrubby overgrown fields. Suitable breeding habitat for Eastern Meadowlark is not present within the subject property, and therefore regulated habitat for this species is absent.

5.4.3 Species at Risk Bats

Habitat for SAR bats (Little Brown Myotis, Northern Myotis, Tricolored Bat (*Perimyotis subflavus*), Silver-haired Bat, Hoary Bat and Eastern Red Bat) is expected to be present within the treed communities of Meadowlily Woods ESA. These communities are present along the northern edge of the subject property within the study area.

The bat habitat assessment completed for the subject property identified three trees within the subject property that may provide roost habitat for bats, including bat SAR. These trees include an isolated tree along the western edge of the subject property (BCT-001), a tree within the former residential area in the south-central portion of the subject property (BCT-002), and a tree within the hedgerow along the eastern edge of the subject property (BCT-003).

Candidate habitat for SAR bats has been mapped in FOD communities within the Meadowlily Woods ESA (Map 5).

5.5 Drainage Features and Fish Habitat

Several headwater drainage features are located along the northern edge of the subject property, within the FOD5-1 community and northern hedgerow. The aquatic habitat assessment determined that none of the features within the study area provide direct or indirect fish habitat. Only feature E, located outside the study area, may provide some indirect contributions to fish habitat within the South Thames River.

Only drainage feature B is currently shown on UTRCA regulation area with a small portion of the regulation area extends onto the subject property. The other drainage features are not mapped as regulated areas on UTRCA mapping.

5.6 Corridors and Linkages

No designated corridors or linkages were identified within the subject property or study area as per The London Plan (2023). The subject property is outside the Thames Valley Corridor, which lies to its north (the Thames River is located approximately 520m to the north of the subject property).

The hedgerow on the eastern edge of the subject property may facilitate small quantities of wildlife movement; however, it does not provide a connection to any natural features or areas on the south side of Commissioners Road. For this reason, it does not provide a linkage function.

6.0 Recommended Ecological Buffer

Buffers are mitigation measures used to protect natural heritage features such as woodlands and SWH from negative impacts due to the development of a site. Ecological buffers are required to protect the natural heritage feature's form and function and to protect the species that inhabit it. The outer limit of the buffers determines the outer boundary of the protected natural features and the constraints to guide development activities within the subject property.

The City of London's EMG (AECOM 2021) provide detailed guidelines for ecological buffers from natural features in accordance with The London Plan (2023). Guidance is provided for the determination of suitable site-specific buffer widths and the implementation and management of site-specific buffer restoration and/or enhancement treatments. The proposed development must conform to the recommended minimum buffer widths unless it is demonstrated that the natural heritage features or functions will be adequately protected by a narrower buffer.

Meadowlily Woods ESA requires a buffer to protect it from activities associated with the proposed adjacent development. Section 5.3.2 of the City of London's EMG (AECOM 2021) states that the required minimum buffer width for an ESA is equivalent to the required minimum width for the component of the Natural Heritage System contained within the ESA. The portion of Meadowlily Woods ESA that borders and partially overlaps with the subject property consists of significant woodland, SWH, and candidate habitat for SAR bats. An ecological buffer width of 30m, as required for significant woodlands under Section 5.3.2 of the EMG, should be applied to the ESA boundary. A 30m ecological buffer from the ESA boundary will protect the significant woodland and its functions. The 30m buffer was agreed to during the Site Suitability and Scoping meeting in April 2023 by the City of London, ECAC, and the UTRCA. The 30m buffer from the woodland dripline, as verified by City staff, is shown on Map 5.

As seen on Map 5, the surveyed dripline results in a jagged buffer line, which would result in an awkward development boundary. In order to provide a more manageable development envelope and more ecologically stable buffer area, a straight setback from the ESA boundary was identified by NRSI and Monteith Brown Planning Consultants, as discussed in the impact analysis, below.

7.0 Impact Analysis, Net Effects Assessment, and Recommendations

Details of the proposed development are included in the following supporting document: Conceptual Site Plan Layouts: 168 Meadowlily Road South Forever Homes (MBPC 2024). The proposed development concept plan is shown on Map 6 and provided in Appendix XI.

7.1 Description of the Proposed Undertaking

The proponent is proposing a residential development consisting of four block areas including a mix of cluster and stacked townhouses and apartment buildings, an internal road network, parking areas, and park land. The proposed development comprises 167 townhouses and five apartment buildings containing a total of 782 units. Municipal water and sanitary sewer services will be installed for the development. A multi-use trail corridor has been proposed on the subject property; it will run along the north side of the proposed development, within the proposed ecological buffer. A chain-link fence will be installed along the northern limit of the multi-use trail corridor to prevent access through the buffer to the Meadowlily Woods ESA. A sanitary sewer is proposed to be located within the multi-use trail corridor. The trail location will be refined during detailed design, but is currently identified on existing agricultural lands (Map 6).

The current recommendation is that stormwater management (SWM) will be provided through on-site controls that will include an internal network of storm sewers that will connect to existing municipal storm sewers along Meadowlily Road South. Stormwater runoff quantity and quality will be managed through on-site controls and low impact development (LID) measures. This approach to SWM will require improvements to the existing municipal sewer system (Dillon Consulting Ltd. 2024).

7.2 Approach to Impact Analysis and Net Effects Assessment

Potential impacts arising from the proposed development are determined by comparing the details of the proposed development with the characteristics of the existing natural features and their functions. Where the development proposal overlaps with the natural features or their buffers, impacts may arise. The following is a description of the types of impacts which will be discussed.

- **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 to the natural features within the subject property associated with disruption or displacement caused by the actual proposed 'footprint' of the undertaking.
- **Indirect** impacts associated with changes in site conditions such as drainage and water quantity/quality.

A summary of impacts, mitigation measures, and net effects is provided in a Net Effects Assessment Table below (Table 8).

7.3 Proposed Buffer

The proposed 30m buffer has been smoothed and a proposed development limit identified on Map 6. The proposed development limit has a variable width of between 24.7m and 34.5m. The area to the north of the development will comprise the ecological buffer. In order to ensure that there is a net gain in buffer area from the 30m buffer shown from the woodland dripline, the total area of exceedance and encroachment within the 30m dripline buffer has been shown on Map 6. Encroachment into the buffer totals an area of 174.07m², while exceedance of the buffer comprises a total area of 488.40m². The proposed development limit and ecological buffer will result in a net gain of 314.33m² of buffer area and will result in a more ecological stable buffer area that can be better protected from edge effects.

The City of London's Cycling Master Plan (City of London 2016) identifies a proposed multi-use trail that will be created along the northern edge of the subject property. The proposed location of this multi-use trail is shown on Map 6. The multi-use trail will be located within the ecological buffer, along its southern edge. The multi-use trail corridor is anticipated to be 8m in width and will include a central multi-use trail with mowed areas to the north and south (MBPC 2024). It is also proposed that sanitary sewer infrastructure will be provided within the area of the multi-use pathway. The inclusion of the sanitary sewer infrastructure within the 8m wide multi-use pathway area was discussed during the EIS scoping meeting with City staff. In accordance with Section 5.4 of the City of London's EMG (AECOM 2021) pathways or trails are a permitted use within ecological buffers to the City's Natural Heritage System (NHS). In accordance with the EMG, passive development such as pathways should comprise no more than a third of the buffer area. Based on an anticipate multi-use trail width of 8m and the variable buffer width of between 24.7m and 34.5m the proposed trail will not occupy more than a third of the buffer area. Section 5.4 of the EMG also permits the inclusion of low impact development measures within buffer areas.

The proposed buffer is appropriate and sufficiently protects adjacent natural features and their ecological functions from impacts associated with the proposed development, and conforms to the minimum buffer widths prescribed in the City of London EMG (AECOM 2021).

7.4 Existing Impacts

Ecological buffers are required by the London Plan (2023) to mitigate impacts from proposed development to protected natural heritage features. The Meadowlily Woods ESA is located to the north of the subject property where development is proposed. The subject property is currently comprised of active agricultural fields. These fields are tilled, maintained and harvested every year. The northern edge of the agricultural fields extends beneath the dripline associated with the significant woodland that is within the Meadowlily Woods ESA. Currently, no buffer is provided between the edge of the agricultural fields and the Meadowlily Woods ESA. The presence of these active agricultural fields and management of these lands for agricultural practices is anticipated to result in negative edge effects to the Meadowlily Woods ESA, the woodland and the flora and fauna that inhabit it. These may include damage to vegetation and the rootzones of trees during tilling and cultivation, disturbance of wildlife in the adjacent woodland, alterations to drainage and agricultural runoff containing fertilizers or other harmful chemicals into the woodland. One of the ravines, associated with Aquatic Feature H, has refuse dumped within it.

Mitigation, Protection, and Compensation

- Implement a variable ecological buffer (average 30m width) from the significant woodland boundary (Recommendation 1). The buffer is approximately 30m in width across its length, varying between 24.7m and 34.5m in width. The buffer area will include an 8m wide multi-use trail corridor, but will otherwise be naturalized. The conversion of agricultural lands to an ecological buffer will provide protection for the ESA and increase the availability of wildlife habitat.
- An Environmental Management and Monitoring Plan (EMMP) is to be developed at the detailed design stage (Recommendation 2). The EMMP will include a planting plan for the buffer area. Plantings and seeding within the buffer area will be comprised of native species to naturalize this area.
- The garbage dumped along Aquatic Feature H should be removed and disposed of properly (Recommendation 3).

7.5 Direct Impacts

Within the subject property, direct impacts to natural features are limited, as the significant woodland is fully protected. The potential direct impacts are discussed in detail below and have been characterized as:

- Vegetation removal;
- Species at Risk; and,
- Site contamination.

7.5.1 Vegetation Removal

Grubbing of the proposed development area will include the removal of vegetation from the subject property. Vegetation removal is proposed to include removal of the agricultural fields, the remnant residential lot, isolated trees and the southwestern portion of the hedgerow along the eastern side of the subject property. The removal of the agricultural lands and the remnant residential lot with isolated trees will not result in the removal of any significant vegetation species. Three Butternuts protected under the Endangered Species Act are present within the eastern hedgerow and are anticipated to require removal as a result of direct overlap with the proposed area of tree removals or damage to their root zones. The removal of these trees is described in greater detail below. No other significant tree or vegetation species are present within the eastern hedgerow.

Damage to vegetation located adjacent to the proposed development area can occur during construction. This may include direct scarring of trees or breaking of branches, or compaction of tree root systems. These impacts can result in the decline of the health of trees, ultimately resulting in mortality. Dust from construction activities may also result in a decline in the health of adjacent vegetation proposed for retention.

Wildlife habitat is limited within areas where vegetation removal has been proposed. Three candidate bat roost trees were identified within these areas and may provide habitat for day roosting bat species. The areas proposed for removal do not provide SWH for bats or good quality habitat for SAR bats due to the extensive presence of high-quality habitat within the Meadowlily Woods ESA; however, there is still the potential for bats to roost in trees that have been proposed for removal. Additionally, there is the potential for tree and vegetation removals to result in the disruption or harm to nesting bird species that are protected under the Migratory Bird Convention Act (MBCA; Government of Canada 2019) or the Fish and Wildlife Conservation Act (FWCA; Government of Canada 1997).

A tree inventory has been completed for the subject property. A comprehensive Tree Preservation Plan (TPP) will be prepared at the detailed design stage once the proposed site plan is fully developed and a site grading plan is available. The TPP will be developed in consideration of the City of London's Tree Protection By-law (no. C.P.-1555-252) (2021), the London Plan (2023), and Section 12 of the Design Specifications & Requirements Manual, Tree Planting and Protection Guidelines (City of London 2019).

Mitigation, Protection, and Compensation

- Development of a comprehensive TPP at the detailed design stage (Recommendation 4). The TPP will identify trees for removal and retention, and identify proposed compensation rates for removed trees, in accordance with the City of London's Tree Protection By-law (no. C.P.-1555-252) (2021), the London Plan (2023), and Section 12 of the Design Specifications & Requirements Manual, Tree Planting and Protection Guidelines (City of London 2019).
- Boundary trees and adjacent land trees are present within the hedgerow to east of the subject property. Removal of these trees must be approved in writing by the adjacent landowner, in this case the City of London (Recommendation 5).
- Installation of Tree Protection Fencing (TPF) along the proposed limit of tree and vegetation removals, where adjacent trees are present (Recommendation 6). The location of TPF will be identified in the TPP once developed (Recommendation 4). The TPF must be erected prior to the initiation of vegetation removals, site clearing and grading.
- The installed TPF is to be inspected by a Certified Arborist or Registered Profession Forester prior to the commencement of work. The barriers are to be maintained and monitored throughout the construction period, and retained trees are to be inspected for damage post-construction as identified in an EMMP (Recommendations 2 and 6).
- Compensation plantings for removed trees (to be determined through the preparation of the TPP) should be provided within the buffer area (Recommendations 1 and 4).
- The removal of vegetation should be timed to avoid the core nesting period for migratory birds as established by the Canadian Wildlife Service (CWS; 2012) (Recommendation 7). This period extends from April 1 to August 31 in southern Ontario. If any tree or vegetation removal is proposed during this period, nest surveys may be conducted by a qualified biologist within small, simple habitat areas (i.e., individual isolated trees and hedgerows) immediately prior to the vegetation

removal activities (within 48 hours) to ensure that nesting birds are not present. If active nests are identified, the nest and an appropriate buffer (determined on a species-by-species basis) should be flagged and protected until the young have fledged and left the nest.

- Some bird species protected under the FWCA nest outside of the core nesting period identified above, these include a number of hawks and owls. Consideration should be given to any nesting bird species during the completion of tree and vegetation removals, and a qualified biologist contacted should an active nest be identified (Recommendation 7).
- SAR bats and their habitats are protected under the Endangered Species Act. In order to avoid impacts to bats and their habitat, trees must be removed outside of the bat active roosting period which extends from April 1 to September 30 (Recommendation 7).
- All recommendations relating to tree removal that will be provided in the TPP once developed should be implemented for the proposed development to ensure no net effect (Recommendation 4).
- Moisten loose soil within the construction area with water to limit dust and establish vegetation cover as soon as possible following soil disturbance (Recommendation 8).

7.5.2 Species at Risk

Habitat for SAR bats is not present within the proposed development area, but is present within woodlands associated with the Meadowlily Woods ESA. No vegetation removals are proposed within these areas; however, there is the potential for day roosting bats to be present in treed areas proposed for clearing. Given the abundance of suitable treed roosting habitat in the local landscape, particularly habitat associated with Meadowlily Woods ESA, and the higher quality of this habitat when compared to isolated trees within the residential lot and hedgerows, the removal of three potential roost trees that are not located within a woodland community will not result in harm to SAR bats or their habitat, as long as appropriate mitigation measures are implemented. Harm to SAR is a contravention of the Endangered Species Act, and vegetation removals must have consideration for these species as described above.

Three Butternuts, two Category 2 trees (JUG-001 and JUG-003) and one Category 3 tree (JUG-002), are present within the hedgerow to the east of the subject property and are protected

under the Endangered Species Act. A single Category 1 tree is also present, but is not afforded protection under the Endangered Species Act. The RHPZ, RHPZ 5m buffer, 25m and 50m habitat zones for each Butternut are shown on Map 6.

Since development is proposed within the RHPZs of all four Butternuts, these trees are not retainable. In accordance with O. Reg. 830/21 Section 25, an exemption under the Endangered Species Act allows for harm to Category 2 or 3 Butternut trees to occur if a species conservation charge is paid to the Species at Risk Conservation Trust (Species Conservation charges). The compensation for the harm to two Category 2 trees (JUG-001 and JUG-003) and one Category 3 tree (JUG-002) will be calculated and completed in accordance with O. Reg. 829/21 (Species Conservation charges). The harm to the Butternuts must also be registered through a Notice of Activity (or Notice of Butternut Impact) with the MECP. Prior to submitting the Notice of Activity, a Butternut Health Assessment (BHA) report must be prepared and submitted to MECP for their approval, the report must be submitted at least 30 days prior to the commencement of work on the subject property. Once the 30 days have elapsed from the report submission, the results of the BHA are considered final.

Additionally, as shown on Map 6, JUG-002 and JUG-003 are located just outside of the subject property on City of London property. As such, approval from the City of London will be required for the impact of these trees.

Mitigation, Protection, and Compensation

- Vegetation removals must take into account the breeding bird season and bat active season (April 1 to September 30) and should be avoided during this period (Recommendation 7)
- A BHA report must be submitted to the MECP at least 30 days prior to the initiation of work on the subject property (Recommendation 9). This report should be submitted following the development of a comprehensive grading plan and preparation of the TPP.
- A Notice of Activity regarding Butternut will be registered with the MECP prior to the initiation of work on the subject property (Recommendation 9).
- A species conservation charge will be calculated and paid to the Species at Risk Conservation Trust in accordance with O. Reg. 829/21 (Recommendation 9).
- The removal or harm to the two Butternuts on the City of London's property will need to be approved by the City of London in writing (Recommendation 5). There may be

opportunities to retain at least one of the trees, depending on the extent of damage to the root zone of the tree and expert opinion from a Certified Arborist. Regardless of the potential retention these trees, payment should be made to the Species at Risk Conservation Trust in accordance with O. Reg. 829/21 (Recommendation 9).

7.5.3 Site Contamination

The maintenance and refueling of machinery and equipment used for construction can result in potential contamination of soils, vegetation and water.

Mitigation, Protection, and Compensation

- Best Management Practices are to be implemented for construction, including development of a spill response action plan and development of a spill contingency plan (Recommendation 10).
- Designated areas located away from natural features and ecological buffers should be identified for refueling and maintenance. These areas should ideally be located on level ground and any runoff must be contained (Recommendation 10).
- Construction equipment and machinery should be inspected regularly by on-site contractors to ensure that it is in good working order and all equipment operators should have a spill prevention kit available (Recommendation 10).

7.6 Indirect Impacts

Indirect impacts result from changes in site conditions such as drainage and water quantity/quality, as well as construction related impacts. Many indirect impacts can be mitigated through the identification of buffers and setbacks. Buffers for the proposed development area discussed in previous sections and shown on Map 6. The potential indirect impacts are discussed in detail below and have been characterized as:

- Site grading;
- Damage to adjacent vegetation
- Alterations to surface water and water balance;
- Changes to water quality;
- Construction runoff, erosion and sedimentation;
- Impacts and disturbance to adjacent natural features and wildlife; and
- Occupancy of future development.

7.6.1 Site Grading

Site grading can result in tree root systems being cut or compressed, hydrological flow patterns being altered, and wildlife habitat being removed. If the site is improperly graded, surface flows from the site may result in sedimentation and erosion within the adjacent Meadowlily Woods ESA.

Grading will be required within the area of the proposed multi-use pathway to allow for the installation of the sanitary sewer infrastructure and construction of the pathway itself. All grading activities associated with the buffer will be located a minimum of 16.7m away from the woodland dripline well outside the area of influence for the root systems of the trees within the woodland. Additionally, this area is currently managed as an agricultural field with tilling, planting and harvesting occurring annually and disturbing the soil and any roots that may be present.

Mitigation, Protection and Compensation

- Development of a detailed grading plan at the detailed design stage. This grading plan will show the limit of proposed grading activities. The location and type of ESC measures to be installed on the development area during construction are to be mapped on this plan. The grading plan should ensure that a portion clean flows from the development area are directed to drainage features associated with the Meadowlily Woods ESA to maintain water balance within this natural feature (Recommendation 11).
- The limit of grading activities is to be demarcated in the field with fencing (anticipated to include a combination of Erosion and Sediment Control (ESC) fencing and TPF, as required) (Recommendation 6).
- Grading activities within the buffer will be limited to the area of the proposed multi-use pathway and sanitary sewer infrastructure. The limit of grading will be confirmed through the development of a comprehensive grading plan and demarcated in the field with fencing (Recommendations 1, 6 and 11).

7.6.2 Alterations to Surface Water and Water Balance

Development of the subject property has the potential to result in alterations to surface water flows and water balance on adjacent lands. Surface water flows from the site currently flow overland to five drainage features that are located along the northern property boundary, within the Meadowlily Woods ESA. These headwater drainage features include features A, B, F, G

and H, as shown on Map 4. Flows from these drainage features discharge to the south branch of the Thames River.

The proposed approach to SWM is described in the Preliminary Stormwater Management Strategy (Dillon Consulting Ltd. 2024). Under existing conditions, almost all of the surface water flows are conveyed to the drainage features associated with the ESA, while a very small portion of the site (0.17ha) drains east toward the City Wide Sports Park. Soils on the site have low permeability, as a result it is anticipated that the majority of flows are conveyed overland. Using the proposed SWM approach, stormwater from the developed area of the site will be conveyed to an on-site storm sewer system, which will connect with the municipal storm sewer located along Meadowlily Road South which discharges water to the south branch of the Thames River. Rainfall within the buffer area will be conveyed overland to the existing drainage features associated with the Meadowlily Woods ESA.

A Preliminary Water Balance Assessment was prepared for the site by EXP (2022c). The proposed development will result in an overall increase of impermeable surfaces including rooftops, roadways, sidewalks, and driveways. This is anticipated to result in a reduction to the post-development infiltration level and increase in estimated runoff from the site. Preliminary calculations indicate that post-development infiltration levels will be approximately 48% of preconstruction infiltration volumes. Additionally, it is anticipated that surface flows to the drainage features within the Meadowlily Woods ESA will decrease with the proposed development of the site. A comprehensive analysis of water balance to these drainage features has not yet been undertaken, but should be completed to ensure that they are receiving adequate rainwater contributions. The SWM strategy for the proposed development will need to ensure that water balance and inputs are maintained post-construction.

The proposed SWM system should consider the use of LID measures and mitigation measures to promote infiltration on-site and direct rainwater to the drainage features within the Meadowlily Woods ESA.

Mitigation, Protection and Compensation

- Develop a comprehensive SWM plan for the proposed development at the detailed design stage (Recommendation 12).

- Complete a comprehensive water balance assessment to ensure water balance is maintained for the drainage features within the Meadowlily Woods ESA (Recommendation 13).
- Incorporate LID measures on-site to promote infiltration, these may include collection of roof-top runoff into swales and vegetative strips to increase infiltration or convey flows to the drainage features within the Meadowlily Woods ESA (Recommendation 12).
- Increase topsoil depth within the buffer area and other areas of greenspace to reduce runoff and promote infiltration (Recommendation 12).

7.6.3 Changes to Water Quality

There is potential for the proposed development to result in a decrease to water quality for water that is discharged from the site to the south branch of the Thames River or infiltrated.

Maintaining the quality of this water is necessary to ensure proper ecological function and groundwater health in the study area and on adjacent lands. Based on the results of EXP's interim hydrogeological report (2022a) the subject property should not be considered a significant groundwater recharge area. Rain water that is conveyed to the municipal storm sewer along Meadowlily Road South is eventually discharged to the south branch of the Thames River and must achieve water quality treatment of 70% long term average total suspended solids (TSS) removal. It is proposed that this will be achieved through the use of on-site controls including LID measures.

Mitigation, Protection and Compensation

- Develop a comprehensive SWM plan for the proposed development at the detailed design stage (Recommendation 12).
- Incorporate LID measures on-site to achieve the target TSS removal average (Recommendation 12).
- Promote infiltration on-site through swale and vegetative strips to provide on-site water quality treatment (Recommendation 12).

7.6.4 Construction Runoff, 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 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 and Compensation

- Development of a comprehensive ESC plan by a qualified engineer that identifies the locations where ESC fencing will be installed and areas where soils and aggregates will be stored (Recommendation 11).
- Install heavy-duty filter fabric ESC fencing along the proposed development limit and around areas of stockpiled soils and aggregates (as identified in the ESC plan) (Recommendation 6).
- Installed ESC fencing is to be inspected by a qualified environmental monitor after installation and weekly throughout the duration of construction to ensure it is functioning as originally intended. The frequency of ESC fencing monitoring should be identified through the development of an Environmental Management and Monitoring Plan (Recommendations 2 and 6).
- Clearing, grubbing, and grading activities should be timed to avoid seasonally wet periods (i.e. spring), whenever possible. Construction should avoid high volume rain events (20mm in 24 hours) and significant snow melts/thaws, resuming once soils have stabilized as to not increase risk of erosion, soil compaction, or the potential for sediment release into nearby natural features (Recommendation 11).
- Planting or seeding should be implemented as soon as possible after construction to stabilize soils (Recommendation 11).

7.6.5 Impacts and Disturbance to Adjacent Natural Features and Wildlife

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.

During construction, invasive plant can be introduced to natural areas through transportation of equipment. The introduction of invasive plant species can negatively impact the establishment of native plants within the buffer area, or reduce the quality of adjacent natural areas.

Mitigation, Protection, and Compensation

- Clearly demarcate limits of development to prevent encroachment during construction (Recommendation 6).
- Implement the City of London's clean equipment protocol (Recommendation 10).
- Suppress dust by moistening areas of bare soil (Recommendation 8).
- Follow soil best management practices. Locate topsoil stockpiles away from areas of wind exposure and away from natural features and ecological buffers. Keep the top layers of topsoil separate from lower layers and limit the upper topsoil pile height 2m to ensure health of the topsoil for later redistribution across the site and buffer area.
- Limit construction activities to between 7:00 and 19:00 (Recommendation 10).
- Lighting equipment should be turned off during non-operation hours or directed away from natural features to prevent lightwash (Recommendation 10).

7.6.6 Occupancy of Future Development

Impacts may arise as a result of occupancy of the proposed development. In this case, these are anticipated to relate to increased use of natural areas by residents, feral/domestic animals, and unauthorized trail/pathway construction. Potential impacts are associated with physical disturbance of vegetation and habitat, noise disturbance on wildlife, debris (i.e. dumping of waste) entering natural features, water quality impairment from pet waste or dumping of substances, and domestic pet impacts on wildlife.

Mitigation, Protection and Compensation

- Implement buffer to woodland/ESA. Enhanced restoration measures, such as tree plantings, topsoil amendments, and/or subsoil treatments, are recommended where appropriate (Recommendation 1 and 2).
- The multi-use trail will reduce buffer encroachment effects (i.e. dumping of yard waste, etc.) as residents are less likely to misuse communal areas and cross a trail to dump waste (Recommendation 1).
- Installation of a chain-link fence on the north side of the multi-use trail to prevent access to the ESA through the buffer area (Recommendation 1).
- Signage along trail stating "Environmentally Significant Area" and providing educational information to trail users about the importance and function of the Meadowlily Woods ESA (Recommendation 1).

- Implementation of the Canadian Standards Association (CSA) Bird Friendly Design Standards (CSA A460) to provide visual barriers on windows within the development (Recommendation 14).
- Implement Best Management Practices for lighting infrastructure to effectively direct light and minimize disruption to local wildlife (Recommendation 14).
- Limit use of commercial fertilizers in landscaped areas (Recommendation 15).
- Limit use of salts or other additives for ice and snow control on the roadways (Recommendation 15).
- Invasive plant species, such as Norway Maple should not be used for street tree planting or anywhere within the proposed development area. Sufficient soil volumes and Best Management Practices should be followed for street tree plantings (Recommendation 16).
- Littering and garbage/yard waste dumping within the surrounding natural features to be mitigated through placement of garbage receptacles at the proposed multi-use trailhead(s) (Recommendation 17).

Table 8. Net Effects Assessment Table

Source of Impact	Potential Areas Affected & Potential Effects	Avoidance, Mitigation, Compensation	Net Effects & Rationale
1.0 Existing Impacts (where opportunities for net positive effects have been identified):			
1.1 Agricultural land adjacent to ESA	<p>Agricultural community:</p> <ul style="list-style-type: none"> -The presence of agricultural field adjacent to the Meadowlily Woods ESA likely results in negative impacts to the natural heritage features. 	<ul style="list-style-type: none"> -Implement a buffer to the woodlands/ESA to protect natural heritage features from impacts from construction activities as well as the completed development. -An Environmental Management and Monitoring Plan (EMMP) is to be developed at the detailed design stage and will include a planting plan for the buffer -Removal of garbage from Aquatic Feature H. 	<p><u>(+) NET POSITIVE EFFECT</u></p> <ul style="list-style-type: none"> -Conversion of agricultural areas adjacent to ESA to native vegetation will provide protection to ESA additional wildlife habitat.
2.0 Direct Impacts:			
Planning & Engineering Design			
2.1 Development design and location	<p>Natural features on-site (woodlands/ESA):</p> <ul style="list-style-type: none"> -Encroachment into natural feature buffers (including proposed multi-use trail) 	<ul style="list-style-type: none"> -Installation of a chain-link fence along the north side of the multi-use pathway to prevent pedestrian access into the buffer and ESA. -Restoration plantings in buffer area adjacent to multi-use trail to provide wildlife habitat and further limit public incursion into significant natural features. -Signage along trail stating "Environmentally Significant Area – Please keep out". -Establish buffers to woodlands/ESA. -Equally compensate areas of buffer removal with additional buffering areas within the property. -Proposed buffer smoothing to provide a more consistent buffer that can be more adequately protected from edge effects. 	<p><u>(+) NET POSITIVE EFFECT</u></p> <ul style="list-style-type: none"> -The planting of native plant species within the buffer will provide additional wildlife habitat.
Construction			
2.3 Site clearing and vegetation removal	<p>Isolated landscape trees within residential community and along western property boundary; trees within eastern hedgerow:</p>	<ul style="list-style-type: none"> -Vegetation removal is recommended to occur outside of the breeding and nesting season for migratory birds and bats, approximately April 1 to September 30. -Should vegetation removal be required during the nesting season for migratory birds, surveys for nesting birds must be undertaken to permit vegetation removal should breeding bird absence be confirmed. 	<p><u>NO NET EFFECT</u></p> <ul style="list-style-type: none"> -Potential impacts from site clearing and vegetation removal can be mitigated through

Source of Impact	Potential Areas Affected & Potential Effects	Avoidance, Mitigation, Compensation	Net Effects & Rationale
	<ul style="list-style-type: none"> -Disruption to migratory birds and their nests. -Removal of three Butternuts, protected under the <i>Endangered Species Act, 2007</i>. -Removal of three candidate bat cavity trees. -Soil instability, resulting in erosion and sedimentation. -Tree removal. -Disruption to local wildlife. -Damage to adjacent vegetation as a result of dust from construction 	<ul style="list-style-type: none"> -Removal of any trees must be in conformity with the City of London Tree Protection By-Law (C.P.-1555-252) (2021a). Though tree removals as a condition of Site Plan Application are exempt, the general protection outlined must still be considered, and a Tree Protection Plan must be prepared. -Restrict all construction activities to daylight hours, when possible. Any artificial lighting used for construction purposes should be turned off or directed away from adjacent natural features following the completion of daily construction activities. -Compensation for the removal of two Category 2 and one Category 3 Butternut trees to be calculated and completed in accordance with O.Reg. 829/21 (Species Conservation charges). -Compensation for the removal of isolated trees and trees within the eastern hedgerow, compensations ratios are to be in-line with the requirements of Schedule A of the City of London Tree Protection By-Law (C.P.-1555-252) (2021a). -Approval from City will be required for the removal of any trees located on City property (including two Butternuts). -Stabilize soils following vegetation removal and grading, by seeding the area with appropriate cover crop (i.e. Annual Rye, <i>Lolium multiflorum</i>) to reduce the potential for sedimentation and erosion. -Moisten soils during construction. -Maintain vegetation wherever possible. -Restoration plan for greenspace or naturalized areas to include suitable native trees, shrubs, and/or seed mixes that are appropriate to site conditions. Seed mix is recommended to include plant species favorable to pollinating insect species, such as Common Milkweed, goldenrods and asters. 	<p>the use of appropriate timing windows and a restoration plan for naturalized areas.</p> <ul style="list-style-type: none"> -The loss of 3 Butternut trees will be mitigated through payment to the Species at Risk Conservation Trust. -Given the likely abundance of suitable bat roosting habitat in the immediate local landscape associated with the ESA, the removal of 3 potential roost trees will not result in harm to SAR bats or their habitat if appropriate mitigation measures are followed. -Trees removed in support of the proposed development and eligible for compensation will be compensated for through tree plantings within the proposed ecological buffer.

Source of Impact	Potential Areas Affected & Potential Effects	Avoidance, Mitigation, Compensation	Net Effects & Rationale
2.5 Site contamination	<p>Natural features on-site:</p> <ul style="list-style-type: none"> -Potential contamination of soils, vegetation, and water. 	<ul style="list-style-type: none"> -All machinery maintenance to be done in a designated area at a high elevation point on-site, where possible. -Implement Best Management Practices, spill action response plan, and spill contingency plan for fuel handling, storage, and on-site equipment maintenance activities. -Contractors on-site should ensure construction equipment is in good working order. Equipment operators should have spill prevention kits available. 	<p><u>NO NET EFFECT</u></p> <ul style="list-style-type: none"> -Potential impacts from machinery maintenance can be mitigated through the implementation of Best Management Practices, spill action response plan, and spill contingency plan
3.0 Indirect Impacts:			
Planning & Engineering Design			
3.1 Site grading	<p>Natural features and vegetation adjacent to site.</p> <ul style="list-style-type: none"> -Compression or cutting of tree root systems. -Changes to hydrological flow patterns. 	<ul style="list-style-type: none"> -Development of a comprehensive grading plan at the detailed design stage. -Identification of the location of ESC measures on-site within the grading plan. -Demarcation of the limits of the development area through ESC fencing and TPF. 	<p><u>NO NET EFFECT</u></p> <ul style="list-style-type: none"> -Potential impacts to adjacent natural features and vegetation can be mitigated through development of a grading plan and ESC plan.

Source of Impact	Potential Areas Affected & Potential Effects	Avoidance, Mitigation, Compensation	Net Effects & Rationale
3.1 Increased hard surfaces; interruption or change of surface water and ground-water flows.	<p>Groundwater resources, natural features on-site and adjacent to site (woodlands/ESA):</p> <ul style="list-style-type: none"> -Changes to water balance, increased runoff. 	<ul style="list-style-type: none"> -Appropriately designed SWM and drainage on-site to maintain the water balance to acceptable standards, this will need to take into consideration contributions to drainage features A, B, F, G, and H. -Increased topsoil depth of 300-400mm in yards and greenspace areas is recommended to reduce runoff. -Establishment of buffer area to provide permeable cover and allow for infiltration of water and surface water flows to drainage features located to the north of the subject property. 	<p><u>NO NET EFFECT</u></p> <ul style="list-style-type: none"> -Potential impacts to surface and groundwater can be mitigated through the use of appropriate stormwater management measures.
3.2 Changes or decrease in water quality	<p>Local watercourses, groundwater resources, natural features on-site and adjacent to site (woodlands/ESA):</p> <ul style="list-style-type: none"> -Changes or decreases to water quality. 	<ul style="list-style-type: none"> -Development of a comprehensive stormwater management plan -Appropriately designed SWM and drainage on-site to maintain the water quality to acceptable standards. -Use of LID measures to ensure the quality of water discharged from the subject property. 	<p><u>NO NET EFFECT</u></p> <ul style="list-style-type: none"> -Potential impacts to water quality can be mitigated through the use of appropriate stormwater management measures.
Construction			
3.3 Construction related run-off, erosion and sedimentation	<p>Local watercourses, natural features on-site:</p> <ul style="list-style-type: none"> -Potential for soil erosion and sedimentation of local watercourses and natural features. -Potential impact to tree root zones. 	<ul style="list-style-type: none"> -A detailed ESC plan is recommended to be prepared to help control and reduce the sediment load of runoff which may flow towards nearby surface water features. -Heavy duty silt fence along buffers and development limits. -Regular monitoring of sediment fences and other ESC measures, particularly following large rain events. -Re-establishing vegetative cover in disturbed areas following the completion of the construction work is recommended. -Monitoring of construction activities to ensure no ESC concerns. 	<p><u>NO NET EFFECT</u></p> <ul style="list-style-type: none"> -Potential impacts from soil erosion and sedimentation can be mitigated through the use of detailed ESC plan, including sediment control fencing.

Source of Impact	Potential Areas Affected & Potential Effects	Avoidance, Mitigation, Compensation	Net Effects & Rationale
3.4 Impacts/Disturbance to Adjacent Natural Features and Wildlife Habitat	<p>Natural Features and Wildlife on and adjacent to site:</p> <ul style="list-style-type: none"> -can cause stresses on the natural features that weaken their ecological integrity. In these states, natural features are more prone to establishment and proliferation of invasive, non-native species. Proliferation of invasive, non-native species within natural communities decreases their ecological value by suppressing native species, diminishing biodiversity, and reducing habitat suitability. -Increased disturbance of wildlife caused by excessive noise, dust, vibrations, lighting, and proximity of human presence during and following construction may cause certain species to abandon or avoid the area for travel, foraging, or nesting. 	<ul style="list-style-type: none"> -Avoidance of clearing, grading and grubbing activities during seasonally wet periods. -Clearly demarcate limits of development to prevent encroachment during construction. -Implement the City of London's clean equipment protocol. -Suppress dust by moistening areas of bare soil. -Locate topsoil stockpiles away from areas of wind exposure and away from natural features and ecological buffers. -Limit construction activities to between 7:00am and 7:00pm. -Lighting equipment should be turned off during non-operation hours or directed away from natural features to prevent lightwash. 	<p><u>NO NET EFFECT</u></p> <ul style="list-style-type: none"> -Impacts to adjacent natural features and wildlife can be mitigated through the implementation of Best Management practices during construction
Development Occupancy			
3.5 Property maintenance, yard waste disposal, non-native planting, domestic pets, lighting, property encroachments, multi-use trail	<p>Local environment, natural features on-site:</p> <ul style="list-style-type: none"> -Potential impact to parks, greenspaces, naturalized or restoration areas. 	<ul style="list-style-type: none"> -Implement buffer to woodland/ESA. Enhanced restoration measures, such as caliper tree plantings, topsoil amendments, and/or subsoil treatments, are recommended where appropriate. -The multi-use trail will inherently reduce buffer encroachment effects (i.e. dumping of yard waste, 	<p><u>(+) NET POSITIVE EFFECT</u></p> <ul style="list-style-type: none"> -The planting of native plant species within the buffer will

Source of Impact	Potential Areas Affected & Potential Effects	Avoidance, Mitigation, Compensation	Net Effects & Rationale
		<p>etc.) as residents are less likely to misuse communal areas and cross a trail to dump waste.</p> <ul style="list-style-type: none"> -Education signage along trail stating “Environmentally Significant Area” and providing information on the importance and function of the ESA. -Implement Best Management Practices for lighting infrastructure to effectively direct light and minimize disruption to local wildlife. -Implementation of the Canadian Standards Association (CSA) Bird Friendly Design Standards (CSA A460) to provide visual barriers on windows within the development and directional lighting to reduce light pollution. -Limit use of commercial fertilizers in landscaped areas. -Limit use of salts or other additives for ice and snow control on the roadways. -Only native species should be used for street tree planting and within the parkland blocks. -Install informational signage in public areas describing adjacent natural areas, important features and functions. -Littering and garbage/yard waste dumping within the surrounding natural features to be mitigated through placement of garbage receptacles at the proposed multi-use trailhead(s). 	<p>provide additional wildlife habitat.</p> <ul style="list-style-type: none"> -Potential impacts from land use can be mitigated through the use of signage, fencing and Best Management Practices.

8.0 Environmental Management and Monitoring Plan

The primary objective of the Environmental Management and Monitoring Plan is to enhance the buffer areas on-site and to 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 resident flora and fauna are expected.

8.1 Environmental Management

The following recommendations are provided for the enhancement of buffer areas:

- Buffer areas within the subject property should be restored through the establishment of native vegetative species suitable to the local conditions. Plantings should be native to the City of London and Middlesex County. Seed mix for buffer areas is recommended to include plant species favourable to Monarch butterfly (and other pollinating insects) such as Milkweed, Goldenrod, and Aster. Seeding and cover crop application will adhere to the City's standardized guidelines (AECOM 2021). Plantings throughout the subject property will generally consist of potted planting stock (i.e. 1-5 gallon size). Caliper tree plantings are recommended in buffer areas as an enhanced restoration measure to further mitigate potential impacts and bolster significant habitats, where appropriate. These tree plantings will meet tree compensation requirements as identified through the preparation of a Tree Protection Plan (TPP). Planting plans will be prepared to the satisfaction of City reviewers (Recommendations 1, 2 and 4).

A comprehensive Environmental Management and Monitoring Plan (EMMP) is to be prepared at the detailed design phase to the satisfaction of the City, consistent with the goals, objectives, and monitoring components described in Section 8.2 of this report.

8.2 Monitoring

During and post-construction monitoring is recommended as a means to ensure the on-site natural features are adequately protected, and the enhancement measures are functioning as intended following build-out of the community. These recommended monitoring components are described below. A fulsome EMMP will be prepared during the detailed design phase and provided as a standalone document, to the satisfaction of the City.

8.2.1 During Construction

- Regular monitoring of sediment fences and other Erosion and Sediment Control (ESC) measures, particularly following large rain events or melt events. Follow ESC maintenance plan once developed (Recommendation 2, 6 and 11).
- Inspection of TPF to ensure it is installed and functioning correctly (Recommendation 4 and 6).
- Inspection of buffer areas to ensure no unauthorized construction encroachments, vegetation damage, or other disturbances (Recommendation 2).
- Fueling of machinery to be undertaken at designated location away from natural heritage features (i.e. at least 30m) (Recommendation 10).
- Storage of machinery and material, fill, etc. in designated areas (Recommendation 10).

8.2.2 Post-Construction

A multi-year post-construction monitoring program will be implemented, starting at 90% build-out of the proposed development. The post-construction monitoring program will focus on inspections of the ecological conditions and integrity of the retained natural features and buffer areas, and will include the following components to be completed annually over the monitoring period for the durations specified below.

- Inspection of planted vegetation to evaluate their survival and success of establishment and identify need for replacement plantings for any dead material, to be completed post-construction as identified in an Environmental Monitoring Plan, to be developed at the detailed design stage (Recommendation 2).
- Inspection of buffer areas to ensure no unauthorized encroachments, vegetation damage, significant invasive species establishment, or other disturbances, to be completed post-construction as identified in an Environmental Monitoring Plan, to be developed at the detailed design stage (Recommendation 2).
- Monitoring of LID measures as described in the SWM plan (once developed) (Recommendation 2 and 12).
- Monitoring of ecological buffer area and associated plantings, including photo plot monitoring (Recommendation 2).

The 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. For example, wherever the monitoring program identifies residual impacts to the ESA or its buffers, the existing mitigation strategy will be reviewed to identify means to improve its effectiveness. The monitoring program will detail potential measures that may be implemented to alleviate observed residual impacts. For example, where buffer 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). Additional mitigative measures will be considered where monitoring results indicate post-construction impact to buffers (e.g., increased signage, warning of fines for unauthorized activities).

9.0 Summary

NRSI was retained by Forever Homes Inc. to complete a SLSR and EIS for the proposed development of the property located at 168 Meadowlily Road South in London. This report provides a summary of the natural features within the subject property, an analysis of the significance and sensitivity of these natural features, a description of the proposed residential development, and an assessment of impacts.

One regulated SAR, Butternut, was identified from the subject property. Butternut Health Assessments and genetic analysis of four individuals confirmed that three of the Butternuts are Category 2 or 3 and genetically pure; the fourth individual is Category 1 and is therefore exempt from protections under the Endangered Species Act and does not require further consideration. Additionally, three trees were identified within the subject property that contain potential roost habitat for bat SAR. Given the expected abundance of suitable roosting habitat in the local landscape, primarily associated with Meadowlily Woods ESA, the removal of three potential roost trees from the subject property that are not located within a woodland community will not result in harm to SAR bats or their habitat, so long as the appropriate mitigation measures are followed. Candidate Bat Maternity Colony SWH, and Eastern Wood-Pewee and Wood Thrush SWH has been identified for the FOD5-1 and FOD5-2 communities located adjacent to, and partially overlapping, the northern edge of the subject property.

A portion of the northern edge of the subject property is designated as part of the Meadowlily Woods ESA. The boundary of the Meadowlily Woods ESA along this boundary has been refined based on the extent of the dripline, as surveyed with the City of London. As such, development is not permitted within this portion of the subject property and appropriate buffers have been provided in order to protect the ecological form and functions of the natural heritage features (woodland, watercourse, wetland, SWH).

An environmental management and monitoring plan will be developed at the detailed design stage. The environmental management plan will describe the establishment of buffer and setback areas and provide recommendations for planting these areas with native vegetation. The multi-use trail desired by the City has been identified adjacent to the proposed development within the ecological buffer. Plantings along this trail have been recommended to reduce informal trail creation by users. The monitoring plan will identify monitoring requirements and schedule for the proposed development. Monitoring during and after construction will ensure the success of mitigation measures within the subject property.

9.1 Summary of Recommendations

Recommendations for impact avoidance, as well as mitigation, restoration and enhancement measures have been provided herein. Recommendations have been numbered in the order that they appear in Section 7 of this report. Assuming the recommendations and mitigation measures provided in this report are followed, negative impacts to the natural environment will be avoided.

Recommendation 1

- Implementation of a buffer area along the northern edge of the proposed development. The buffer will include:
 - Restoration of the buffer area with native planting and topsoil restoration.
 - Installation of a chain-link fence along the north side of the proposed multi-use trail corridor.
 - Installation of educational signage along trail.

Recommendation 2

- Development of an EMMP at the detailed design stage.
- The EMMP will include a planting plan for the proposed buffer area.
- The EMMP will identify during- and post-construction monitoring requirements for the proposed development.
- Monitoring will include:
 - During construction monitoring of ESC fencing and TPF
 - Post-construction monitoring of the buffer area included photo plots.

Recommendation 3

- Removal of garbage dumped along drainage feature H.

Recommendation 4

- Development of a comprehensive TPP at the detailed design stage, the TPP will include:
 - An analysis of trees to be removed and retained from the subject property and adjacent lands.
 - Mapping showing the proposed locations where TPF is to be installed.
 - Identification of proposed compensation rates for removed trees, in accordance with the City of London's Tree Protection By-law (no. C.P.-1555-252) (2021), the London Plan (2023), and Section 12 of the Design Specifications &

Requirements Manual, Tree Planting and Protection Guidelines (City of London 2019).

Recommendation 5

- Approval from adjacent landowners (City of London) for the removal or impact to boundary trees including two Butternuts located on City property.

Recommendation 6

- Installation of TPF and ESC fencing along the limit of development, as identified in the TPF and detailed grading plan.
- Inspection of TPF and ESC fencing by a Certified Arborist or Environmental Monitor following installation.

Recommendation 7

- Adherence to seasonal timing restriction for the removal of vegetation during construction, including:
 - Avoidance of the core nesting period for breeding birds in southern Ontario which extends from April 1 to August 31.
 - Avoidance of the bat active season in southern Ontario which extends from April 1 to September 30.

Recommendation 8

- Implement soil best management practices, these should include:
 - Moistening loose soil within the construction area with water to limit dust and establish vegetation cover as soon as possible following soil disturbance.
 - Locate topsoil stockpiles away from areas of wind exposure and away from natural features and ecological buffers.
 - Keep the top layers of topsoil separate from lower layers and limit the upper topsoil pile height 2m.

Recommendation 9

- Submission of a BHA to the MECP at 30 days prior to impact to the Butternuts on and adjacent to the subject property.
- Registration of a Notice of Activity regarding Butternut with the MECP prior to the initiation of work.

- Calculation and payment of a species conservation charge to the Species at Risk Conservation Trust in accordance with O. Reg. 829/21.

Recommendation 10

- Best Management Practices are to be implemented for construction; these should include:
 - Development of a spill response action plan and spill contingency plan.
 - Identification of designated areas for equipment and vehicle refueling or maintenance.
 - Regular inspection of construction equipment and machinery.
 - Implementation of the City of London's Clean Equipment Protocol.
 - Limit construction activities to between 7:00 and 19:00.
 - Lighting equipment should be turned off during non-operation hours or directed away from natural features to prevent lightwash

Recommendation 11

- Development of a detailed grading plan at the detailed design stage. The detailed grading plan should include a detailed description of the proposed ESC measures and a map showing their locations within the development area.

Recommendation 12

- Development of a comprehensive SWM plan at the detailed design stage, the SWM plan should include:
 - The use of LID measures and on-site controls to promote infiltration and ensure the target TSS removal average of 70% is met.
 - Recommendations to increase topsoil depth within the buffer area and other areas of greenspace to reduce runoff and promote infiltration.

Recommendation 13

- Completion of a Water Balance Assessment to ensure that water balance is maintained to drainage features and watercourses within the study area and on adjacent lands.

Recommendation 14

- Implementation of the Canadian Standards Association (CSA) Bird Friendly Design Standards (CSA A460) and Best Management Practices for lighting to prevent disturbance to wildlife in adjacent natural areas post-construction.

Recommendation 15

- Limit the use of commercial fertilizers and salt post-construction to prevent contamination of runoff to adjacent natural features.

Recommendation 16

- Avoid the use of invasive plant species and follow the Best Practices for tree plantings within the development area.

Recommendation 17

- Mitigate littering and garbage/yard waste dumping within the surrounding natural features by placing of garbage receptacles at the proposed multi-use trailhead(s)

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