



Final

3080 Bostwick Road, London – Blocks 7, 8 and 9

Environmental Impact Study

Prepared for:

York Developments
303 Richmond Street, Suite 201
London, ON N6B 2H8

And

City of London
Planning Services
206 Dundas Street
London, ON N6A 1G7

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NATURAL RESOURCE SOLUTIONS INC.

Aquatic, Terrestrial and Wetland Biologists

3080 Bostwick Road, London – Blocks 7, 8 and 9

Environmental Impact Study

Project Team

Katharina Richter	Senior Biologist, Project Advisor
Dan Riley	Terrestrial and Wetland Biologist, Project Manager
Danielle Heaven	GIS Analyst

Report submitted on April 24, 2026



Dan Riley

Project Manager

Terrestrial and Wetland Biologist

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1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained in April 2019 by Kilbourne Developments and Westgate Developments (London) Inc, c/o York Developments to complete a Subject Lands Status Report (SLSR) and subsequent Environmental Impact Study (EIS) for a proposed development in the southwest of London, Ontario. The current subject property (Map 1) was surveyed as part of the previous SLSR completed in 2019 for the properties known as the 'Kilbourne and Westgate Lands'. Since then, York Developments has requested the subject property be assessed separately from the lands directly to the south.

This Environmental Impact Study (EIS) has been prepared in accordance with the updated City of London's Environmental Management Guidelines (2025). This report summarizes the work completed in support of the Kilbourne and Westgate Lands Subject Lands Status Report (SLSR) (NRSI 2021) which helped to characterize the natural features present within the subject property (Map 1). An Environmental Impact Study report was subsequently prepared by NRSI for the Kilbourne Lands (2026) and has been submitted under a separate cover. Similarly, an EIS was prepared for the lands to the north of the subject property (3080 Bostwick Road) by Stantec (2020) and an Environmental Assessment (EA) was prepared for the Bostwick Road improvements by Parsons (2019); these reports were reviewed in the preparation of this EIS. Data from these reports has been drawn upon to identify species present within the broader study area and potentially significant habitats.

For the purposes of this report, the term "subject lands" refers to the area of interest owned by York Developments, consisting of Blocks 7, 8 and 9 on the property at 3080 Bostwick Road, London. The term "study area" refers to the subject property plus lands within approximately 120m of the area. Detailed biological surveys were undertaken by NRSI on within the broader study area during the preliminary site assessments in support of the Kilbourne Lands EIS (NRSI 2026). Legacy data collected from agencies encompassed the study area to ensure that all surrounding natural features were considered.

The subject lands, shown on Map 1, are approximately 4ha in area and are located southeast of the intersection of Bostwick Road and Southdale Road West. The subject lands border Bostwick Road to the west, and consists of annual row crop fields, a woodland in the south, and the Thorncroft Drain and associated riparian habitat that borders the property in a north-south direction to the east. The subject lands are located within Ecoregion 7E.

1.1 Project Scoping

In order to determine a study approach for the EIS, existing natural heritage information was first gathered and reviewed to identify key natural heritage features and species that are reported from or have potential to occur within the study area. This included the following background information sources:

- Upper Thames River Conservation Authority (UTRCA);
- Ministry of Natural Resources and Forestry (MNR), Aylmer District;
- The London Plan (2026);
- City of London Environmental Management Guidelines (2025);
- Natural Heritage Information Centre (NHIC) database (MNR 2025);
- Dingman Creek Subwatershed: Stormwater Servicing Study Phase 1 Report (Aquafor Beech Limited 2020);
- Dingman Creek Subwatershed Study Update (Delcan 2005);
- Subject Lands Status Report and Environmental Study Report - Bostwick Road Improvements Municipal Class EA (Parsons 2019);
- 3080 Bostwick Road - Environmental Impact Study (Stantec 2020);
- Kilbourne and Westgate Lands Subject Lands Status Report (NRSI 2021);
- Kilbourne Lands Environmental Impact Study (NRSI 2026);
- Middlesex Natural Heritage System Study (UTRCA 2014);
- Dingman Creek Watershed Report Card (UTRCA 2017);
- Southwest Area Secondary Plan (City of London 2024);
- Aquatic Species at Risk Mapping (DFO 2025);
- Ontario Breeding Bird Atlas (Bird Studies Canada et al. 2008);
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2019);
- Atlas of the Mammals of Ontario (Dobbyn 1994);
- Ontario Butterfly Atlas (Macnaughton et al. 2025); and,
- Ontario Odonate Atlas Database (OOAD 2023).

Wildlife species lists were compiled to provide information on species reported from the vicinity of the study area using the various data sources listed above. These species lists were used to guide the scope and type of wildlife field surveys required as outlined in the following sections. NRSI had completed field surveys for an adjacent property in 2019, which assessed habitat within the subject lands. These surveys in conjunction with surveys conducted by Parsons

(2019) and Stantec (2020) will inform species and habitat presence. The EIS has been prepared based on work completed to the south by NRSI associated with the Kilbourne and Westgate Lands SLSR (2021), and based off the September 25, 2017 scoping meeting with Stantec for work to the north of the subject property (Stantec 2020) and the scoping meetings held for the completion of the Kilbourne Lands EIS (NRSI 2026). The scoping of the EIS was also guided by the Scoping Meeting associated with the Bostick Road EA held on June 2, 2016 by the City of London and Parsons (Parsons 2019).

Based on the species lists, prepared by NRSI, a number of Protected Species and Species of Conservation Concern (SCC) were identified as having records from the vicinity of study area. For the purposes of this EIS, Protected Species are those listed on the Protected Species in Ontario List (O. Reg. 60/26 <https://www.ontario.ca/laws/regulation/260060>). These include species identified by the Committee on the Status of Species at Risk in Ontario (COSSARO) as provincially threatened or endangered. These species are protected by the *Species Conservation Act* (SCA), which includes protection of their habitat.

Species of Conservation Concern (SCC) are those identified as:

- species that have been assigned a conservation status (S-Rank) of S1 to S3 or SH by the NHIC;
- Species classified as Special Concern by the COSSARO, and
- Species that are designated federally as Threatened or Endangered by the Committee for the Status of Endangered Wildlife in Canada (COSEWIC) but not provincially by the COSSARO.

Aquatic species and migratory birds listed as Threatened or Endangered on Schedule 1 of the *Species at Risk Act* (SARA) have also been considered in this EIS. The residence of these species and Critical Habitat of listed aquatic species is protected on all lands. For the purposes of this report, these species are considered federally regulated species.

A screening exercise was conducted for these species to identify whether suitable habitat may be present within the study area. This involved cross-referencing the preferred habitat for reported Protected Species, SCC and federally regulated species (OMNR 2000; MECP 2024) against habitats known to occur within the subject lands or adjacent properties. This was completed to ensure that the potential presence of all Protected Species, SCC and federally regulated species within the study area was adequately assessed in this EIS. The significant

species screening table, updated based on the results of field surveys and available background information, is provided in Appendix I.

A screening exercise was also conducted to determine the presence of any SWH types within the study area. The Significant Wildlife Habitat Technical Guide (SWHTG) outlines the types of habitats that the MNR considers significant in Ontario, as well as criteria to identify these habitats for Ecoregion 7E, in which the study area is located (OMNR 2000, MNRF 2015). The SWHTG groups SWH into four broad categories: seasonal concentration areas, rare vegetation communities and specialized wildlife habitat, habitats of SCC, and animal movement corridors. Based on the results of the screening exercise, several confirmed and candidate SWH types were identified as occurring or having the potential to occur within the study area. The final SWH screening updated based on the results of field surveys and available background information is provided in Appendix II.

1.2 Proposed Undertaking

The proposed development of Blocks 7, 8 and 9 within the 3080 Bostwick Road subject lands will consist primarily of medium-density apartments and residential development in addition to internal roads and an open space block associated with the Thornicroft Drain (MHBC 2025, Zedd Architecture 2025). Stormwater management for Block 7 will be provided through an on-site stormwater management facility and LID stormwater management through the use of an infiltration gallery within the proposed ecological buffer. Stormwater management within Blocks 8 and 9 will be provided through a stormwater pond associated with the Kilbourne Lands development located to the immediate south of Block 8 and 9 (Stantec 2025, NRSI 2026).

2.0 Relevant Policies, Legislation and Planning Studies

For the purposes of this report, information on the natural heritage features within the subject lands and adjacent areas was collected and assessed for significance. To help inform suitable land-use concepts, guide the layout of development, and identify areas to be protected, these features are evaluated against the relevant policies, legislation, and planning studies outlined in Table 1.

Table 1. Relevant Policy, Legislation and Planning Studies

Policy/Legislation/Plan	Description	Project Relevance
Provincial Planning Statement (PPS) (OMMAH 2024).	- Issued under the authority of Section 3 of the Planning Act and came into effect on October 20, 2024, replacing the 2020 Provincial Policy Statement. - Section 4.1 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 associated criteria schedules (MNRF 2015) were prepared by the MNRF to provide guidance on identifying natural features and in interpreting the Natural Heritage sections of the PPS.	- Natural features that occur or may occur within the study area, which receive protection under the PPS, include: - Significant Woodland, - Significant Valleyland, - Significant Wildlife Habitat, - Fish Habitat, and - Habitat for Endangered or Threatened species.
Species Conservation Act (SCA), 2026	- The SCA and its regulations replaced the 2007 Endangered Species Act on March 30, 2026. - This has resulted in a number of changes to how at-risk species are addressed in planning and development processes in Ontario. - The SCA takes a "registration-first" approach for activities impacting at-risk species, though permits are still required for some activities. - Protected species now listed on the Protected Species in Ontario List. - Protections for species on the Protected Species in Ontario List are described as "Section 16 activities" and include killing, harming, capturing or taking of a member of a species or damage to or destruction of the habitat of a species.	- Based on preliminary screening and previously conducted field surveys, there is some potential for regulated habitat for Protected Species to occur within the project study area. - Incidental observations of protected plant species were documented by Parsons (2019) and candidate protected bat species habitat is present within the study area.
Species at Risk Act (SARA), 2002	The SARA is federal legislation that protects species listed as Endangered, Threatened or Special Concern on Schedule 1 of the Act.	Based on preliminary screening and previously conducted field surveys, there is some potential for

Policy/Legislation/Plan	Description	Project Relevance
	- SARA prohibits killing, harming, harassing, capturing, or taking of individuals. - Under SARA, prohibitions regarding individuals and residences for migratory birds and aquatic SAR apply wherever they occur in Canada (including private lands). - For terrestrial SAR, these prohibitions only apply on federal lands. - In the case of a migratory bird species listed under the <i>Migratory Birds Convention Act</i>, certain SARA prohibitions protecting individuals and residences (e.g., nests or dens) of Endangered, Threatened and Extirpated species apply automatically. - In the case of aquatic SAR, SARA prohibitions protect individuals, residence (e.g., fish spawning areas, mussel beds or burrows) and identified critical habitat.	federally regulated SAR to occur within the project study area. Incidental observations of migratory bird SAR were documented from the study area.
Migratory Birds Convention Act (MBCA), 1994 and Migratory Bird Regulations (MBR), 2022	- The MBCA protects migratory game birds, insectivorous birds, and several other migratory non-game birds from persecution in the form of harassment. - The schedule of on-site work must consider MBCA timing windows, with timing of breeding bird season typically occurring between April 1 to August 31 (depending on applicable ecozone); however, this is a guideline, since the MBCA applies anytime a migratory bird is nesting. “Incidental take” (unintentional harming, killing, disturbance, or destruction of migratory birds, their nests, or eggs as a result of an activity that is not specifically targeting the bird or nest) is considered illegal, with the exception of a permit obtained by the Canadian Wildlife Service. - Schedule 1 of the MBR 2022 provides year-round nest protection for 18 species that are known to re-use nests annually.	- Species protected by the MBCA and MBR were identified in the background screening and during field surveys. - The timing of construction activities, especially vegetation clearing must have consideration for the MBCA. Typically, this involves avoiding tree and vegetation removal during the peak breeding bird period (April 1 to August 31).
Canadian Fisheries Act (1985)	- Manages threats to all fish and fish habitats in Canada. - The Act prohibits harmful alteration, disruption or destruction of fish habitat (HADD). - DFO has developed an online, assessment tool, where proponents can determine whether their project activities require DFO review based on the type of	The Thornicroft Drain provides fish habitat.

Policy/Legislation/Plan	Description	Project Relevance
The London Plan (2026)	water body the work is occurring in and the nature of the proposed activity. • The London Plan is the City of London's Official Plan. It was adopted by City Council in June 2016 and approved by the Minister December 2016. The most recent version was consolidated in January 2026. It outlines current policies for the protection of natural features within the City of London. • The Natural Heritage policies establish requirements for the identification, delineation and protection of the natural heritage features and areas that form the City of London's Natural Heritage System. • The City of London Subwatershed Plans provide background, framework and broad direction for the content and implementation of the natural heritage and water resource management policies of this Plan.	• Map 1 of the Plan identifies portions of the study area as Green Space. • Map 5 of the Plan indicates the presence of a Significant Woodland (directly south of subject lands), and Significant Valleylands associated with the Thornicroft drain. An unevaluated wetland was identified within the Significant Woodland during 2019 field surveys by NRSI for the adjacent property (NRSI 2024). • All wetlands, regardless of size, are to be protected under the Natural Heritage System policies. • An EIS is required as development is proposed within 120m of designated natural features identified on Map 5 (Natural Heritage) of the London Plan, these include: ○ Fish Habitat; ○ Wetland; ○ Significant Woodland; ○ Significant Valleyland; and, ○ Significant Wildlife Habitat.
City of London Environmental Management Guidelines (2025)	• Outlines policy guidelines, standards, process and procedures for the preparation and review of Environmental Impact Studies, determination of buffers and setbacks, evaluation of significant woodlands, etc.	• The proposed development is located within 120m of significant natural heritage features, an EIS is required and as such, the Environmental Management Guidelines are to be followed through the project steps, including data collection standards, and guidelines for determining setbacks and ecological buffers. • The report covers the components of both the SLSR and the EIS and relies on both original field data collected for the subject lands

Policy/Legislation/Plan	Description	Project Relevance
		and background data collected by NRSI and other consulting firms for lands to the immediate north and south.
Southwest Area Plan (City of London 2024)	- Applies to lands in the southwest area of the City of London and was created to guide long-term management and approval of growth. - The Southwest Area Plan was incorporated into the London Plan.	- Serves as a review of planning applications which is used in conjunction with the other policies in the London Plan. - The subject lands are located within the area addressed by the Southwest Area Plan.
O. Reg. 41/24 Prohibited Activities Exemptions, and Permits (Government of Ontario 2024)	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 Upper Thames River Conservation Authority (UTRCA) jurisdiction.	- Lands regulated by the UTRCA are present within the study area and subject lands. - Regulated areas include wetlands, and the Thornicroft Drain. - Development, alteration, or interference with wetlands is prohibited within 30m of a wetland, subject to approval by the UTRCA. - The UTRCA may grant permission of development within regulated areas should it shown that no impact will occur. An application for submission must be submitted to the UTRCA prior to any approval for development within these regulated areas.
Bostwick Road Improvements Municipal Class Environmental Assessment (Parsons 2019)	- A SLSR and EIS for the realignment of Bostwick Road and Wonderland Road on the property to the immediate south of the subject property. - Contains reports on vegetation, birds, reptiles and amphibians, significant features, fish and fish habitat and benthic invertebrates.	- The report was reviewed with particular focus on significant species and SWH observations and recommended buffers.
Dingman Creek Subwatershed Stormwater Servicing Study (Aquafor Beach 2020)	- A stormwater servicing strategy for the Dingman Creek subwatershed study, Stage 1 lands, with consideration for flooding, erosion, groundwater, wildlife and aquatic habitat, as well as natural corridor development. - The North Lambeth (Thornicroft Drain) is addressed.	- Covers all aspects of the Thornicroft Drain watershed with comprehensive consideration of previously completed EAs and studies. - Contains information relating to the species present within the Thornicroft Drain and issues pertaining to habitat quality.

Policy/Legislation/Plan	Description	Project Relevance
		- Provides detailed information regarding stormwater management requirements within the study area. - Provides detailed information regarding setbacks and significant features.
3080 Bostwick Road Environmental Impact Study Updated 2020 (Stantec 2020)	- An EIS report prepared by Stantec for the development of the lands to the immediate north of the subject property, at 3080 Bostwick Road. - Provides background data on vegetation, wildlife, significant features, Species at Risk, fish and fish habitat. - Provides recommendations for development constraints, mitigation measures, and monitoring.	The report was reviewed for information on significant species, SAR habitat and SWH identification, in addition to buffer recommendations.

3.0 Field Methods

Terrestrial and aquatic field surveys were undertaken within the subject lands, and adjacent to the subject lands through the SLSR and EIS prepared by Parsons for the Bostwick Road Improvements Municipal Class Environmental Assessment (EA) (2019), the EIS prepared by Stantec for 3080 Bostwick Road (north of the subject lands) (2020), the SLSR prepared by NRSI for the Kilbourne and Westgate Lands (2021) and the EIS prepared by NRSI for the Kilbourne Lands (2026). Site specific field survey data was supplemented through the completion of original field surveys by NRSI in 2022 and 2025. The detailed methods implemented for the background studies used to inform this EIS can be found in the respective reports, with brief summaries provided below, while the methods used for the original field surveys undertaken by NRSI are detailed below. Field survey stations are shown on Map 2.

3.1 Terrestrial Field Surveys

3.1.1 Vegetation Surveys

Vegetation community delineation was informed by Ecological Land Classification (ELC) surveys and vegetation inventories undertaken by Stantec in 2014, 2015 and 2017 (Stantec 2020). NRSI completed ELC surveys and vegetation inventories, for the lands to the south of the subject lands in 2019 and 2021. The data provided through these background studies was refined for the subject lands through an ELC survey and vegetation inventory conducted by NRSI on March 15, 2022.

During the completion of NRSI's vegetation surveys, the standard ELC System for southern Ontario was applied (Lee et al. 1998). Details of vegetation communities were recorded, including species composition, dominance, uncommon species or features, and evidence of human impact. During each field survey all species of vascular flora were recorded, with UTM locations recorded for any locally or provincially rare species.

3.1.2 Natural Feature Delineations

NRSI completed delineations for natural features that occur on and adjacent to the subject property, including woodlands and wetlands. Wetland boundaries were collected by NRSI on October 8, 2019 and were reviewed in the field with City Ecologist James Mackay and UTRCA Ecologist Tara Tchir. Wetland boundary points were collected through the use of a SXBlue II GNSS GPS unit, which collects point data with sub-50 cm accuracy.

NRSI collected woodland driplines associated with the subject property during the ELC survey conducted on March 15, 2022. This dripline was updated on August 18, 2025 to ensure the accuracy of the mapped boundary. NRSI collected woodland driplines through the use of a SXBlue II GNSS GPS unit.

3.1.3 Migratory Bird Survey

A single migratory bird survey was conducted by NRSI for the lands to the south of the subject property on April 10, 2019 (NRSI 2021, 2026). This survey was implemented to document the use of natural features by migratory birds; a single point count station (BSS-001) was located along the southern edge of the property study area and provide data for the lands that are the subject of this report.

During migratory bird surveys, NRSI avian biologists documented all bird species, and numbers of individuals observed.

3.1.4 Breeding Bird Surveys

Breeding bird surveys were conducted by Stantec in 2008, and 2015 (Stantec 2020). Surveys generally followed the methods authored by Environment and Climate Change Canada for conducting breeding bird surveys (ECCC 2018). These methods recommend the completion of breeding bird surveys between May 28 and July 7. During the 2008 survey season, two rounds of breeding bird surveys were conducted, while three rounds were conducted in 2015. Bird surveys included the use of both point counts, and area searches.

Two of the breeding bird point count stations established by Stantec (BB2 and BB3) are located within the subject property that is the focus of this report. Point counts that were 10 minutes in duration were conducted at each survey station. During each point count all birds heard or seen were recorded and the highest level of breeding evidence observed, as defined by the Ontario Breeding Bird Atlas (OBBA), was documented. The total number of individuals of each species observed was also documented.

During area searches, all main habitat types within the subject property were traversed on foot. All bird species observed were recorded, along with the feature that the species was observed in and the highest level of breeding evidence detected.

NRSI completed breeding bird surveys on the Kilbourne Lands between May and July 2019 (NRSI 2021, 2026). Surveys consisted of 10-minute point counts at seven stations, one of

which (BSS-001) was located adjacent to the study area for 3080 Bostwick Road – Block 7, 8 and 9. Surveys were undertaken between May 24 and July, between the hours of dawn and 1000hrs. Survey stations were consistent with those used for the migratory bird surveys. All visual and auditory observations of birds were recorded in addition to the highest level of breeding evidence exhibited by each species.

3.1.5 Herpetofauna Surveys

Snake Surveys

As a component of the field surveys undertaken for the Kilbourne Lands by NRSI, cover board surveys were undertaken to identify snake species present within the subject lands (NRSI 2021, 2026). A total of 15 snake cover boards were installed on the Kilbourne Lands, two of these boards (SNK-014 and SNK-015) were located along the southern boundary of the 3080 Bostwick Road – Block 7, 8 and 9 subject lands, and provided data for this EIS report.

Each board measured 4ft x 4ft with the upper surface painted black to absorb heat. Boards were checked a total of six times between April 24 and July 10, 2019 for the presence of snakes. The cover boards were checked in the morning or late evening to avoid hot mid-day temperatures when snakes may avoid using the boards to thermoregulate. All snake species, number of individuals, approximate length, and behaviour were recorded.

Anuran Call Surveys

Anuran call surveys were conducted by Stantec in 2014 and by NRSI in 2019 for the properties to the north and south of the subject lands (Stantec 2020; NRSI 2021, 2026). All anuran call surveys were conducted in accordance with the Marsh Monitoring Program protocol (BSC 2009). Three of Stantec's survey stations (A, B and C) and one of NRSI's survey stations (ANR-006) were associated with the project study area. Anuran call surveys focused on calling frogs and toads during 3-mute long surveys, data recorded included species, call intensity and estimated number of individuals.

Stantec's anuran call surveys were conducted on May 1 and May 28, 2024. The first survey was not conducted in April due to a late and cold spring, while a third survey in June was not completed since all pooling habitat for amphibian breeding had dried up by the end of May (Stantec 2020). NRSI's anuran call surveys were conducted on April 9, May 16 and June 12, 2019.

3.1.6 General Wildlife

During all field surveys conducted by NRSI and Stantec, any observations of birds, mammals, herpetofauna, and insects were documented. This included direct observations of individuals, as well as signs of wildlife presence (i.e. tracks, scat, dens, nests, etc.).

3.2 Aquatic Surveys

3.2.1 Headwater Drainage Feature Assessment

NRSI completed an assessment of Headwater Drainage Features for the Kilbourne Lands to the south of the subject lands in 2019 (NRSI 2021, 2026). These surveys were conducted following the *Evaluation, Classification and Management of Headwater Drainage Features Guidelines* (TRCA and CVC 2014) and the Ontario Stream Assessment Protocol (OSAP) Headwater Sampling Protocol (Module S4.M11, Gorenc and Stanfield 2017), NRSI biologists conducted 3 assessments on the headwater drainage features (HDFs) that flow to the Thornicroft Drain within the Kilbourne Lands. Assessments took place on April 9, June 5, and July 9, 2019. Aerial photographs were examined to identify candidate HDFs within the Kilbourne lands prior to confirming presence on site.

In the field, each HDF was subdivided into reaches that were identified based on changes in riparian condition, channel morphology, or tributary confluence. Each reach was given a unique identifier based on the following formula:

Stream Name (TDT)–HDF Code (#)–Reach Code (#)

The Stream Name refers to Thornicroft Drain (TDT); the HDF Code references a unique headwater number (1 to 18); and the Reach Code refers to each reach surveyed along the HDF (1 to 5). Three HDFs were identified within the study area of 3080 Bostwick Road – Block 7, 8 and 9. These HDFs include TDT10, TDT11, and TDT12.

Each HDF was assessed through 4 steps to evaluate and classify its functional importance and to identify management recommendations. Step 1 evaluates the hydrologic contribution and function of each reach; Step 2 assesses the riparian vegetation and conditions; Step 3 assesses the feature's contribution to fish and fish habitat; and Step 4 evaluates the terrestrial habitat function each reach provides. The field work included documenting information on ecological and geomorphological form and function to inform these steps. The information collected at several locations within each reach included the following:

- Bankfull width and depth;
- Wetted width and depth;
- Bank height;
- Bank angle;
- Bank material;
- Substrate composition;
- Flow velocity;
- Riparian habitat type;
- Feature vegetation; and
- Observed wildlife.

3.2.2 Aquatic Habitat Assessment and Temperature Monitoring

NRSI conducted aquatic habitat assessments for the Thornicroft Drain as part of the field studies for the Kilbourne Lands to the south of the subject lands (NRSI 2021, 2026). Aquatic habitat assessments following a modified OSAP protocol were conducted on July 9 and July 10, 2019 within the Thornicroft Drain, from Southdale Road West to Bostwick Road, as well as upstream and downstream of Wharncliffe Road South, in order to get a fulsome understanding of the feature. Aquatic habitat assessment reach 4 (AHA-004) corresponds with the 3080 Bostwick – Block 7, 8, and 9 subject lands and study area. The following information was recorded for each aquatic habitat segment within the subject lands, where possible:

- substrate type;
- channel depth, width, etc.;
- water temperature;
- dissolved oxygen;
- bank stability;
- aquatic vegetation cover; and
- critical life stage areas (i.e. spawning, nursery habitat, etc.).

In addition to the habitat assessments, temperature monitoring within the Thornicroft Drain was performed to further characterize the aquatic conditions within the study area and assist in the determination of sensitivity and potential habitat suitability for aquatic species. Air temperature measurements were taken as well. Surface water temperature and air temperature monitoring was completed through the installation of continuous temperature data loggers on June 5, 2019.

A water temperature monitoring station was established just south of the study area, and provides data for reach 4 of the Thornicroft Drain. An air temperature logger was installed beside the Thornicroft Drain within a tree. Following the removal of temperature loggers on November 6, 2019, the air and water temperature data was compared to precipitation levels recorded by Environment and Climate Change Canada monitoring station 6144478 within the City of London, in order to determine trends in surface water temperatures within the study area. The data was also analyzed following the thermal nomogram protocol for the determination of thermal regimes (Chu et al. 2009) in order to classify the thermal regime within the study area.

3.2.3 Benthic Invertebrate Sampling

NRSI conducted benthic macro-invertebrate surveys as a component of the field studies for the Kilbourne Lands (NRSI 2021, 2026). These surveys were carried out June 5, 2019 to assess the general health of the aquatic habitats within the subject lands using benthos as indicators of water quality. Two benthic macro-invertebrate sampling locations were assessed following the standard BioMap protocol, one of these stations (BMS-002) is located just south of the 3080 Bostwick – Block 7, 8 and 9 study area, while the second station (BMS-001) was located well south of the study area (NRSI 2021, 2026). Each monitoring station was comprised of three samples consisting of two fixed area quantitative samples and one qualitative sample to allow for analysis through a variety of assessment metrics. Each fixed area sample was assessed using a 0.05m² Surber sampler with each qualitative sample assessed following the *Ontario Benthos Biomonitoring Network Protocol Manual* (OBBN) Travelling Transect Kick and Sweep methodology to characterize the benthic community. Samples were preserved in a buffered 70% ethanol solution for identification in NRSI's benthic invertebrate laboratory.

3.2.4 Fish Community Sampling

NRSI conducted fish community sampling component of the field studies for the Kilbourne Lands (NRSI 2021, 2026). Fish community sampling was conducted on July 9, 2019 utilizing a Smith-Root backpack electroshocker (Model LR-24), a dip net, and an aerated portable container. Fish sampling followed the screening level assessment identified in OSAP (Stanfield 2017). Starting downstream and moving against the flow, a current was introduced into the water to temporarily paralyze fish. The sampling targeted different habitat types within the watercourse to fully assess the fish community present. Sampling occurred in two locations, at the downstream and upstream extent of the subject lands where there was a definitive break in habitat type. One of these sampling locations (EMS-002) was located within reach 4 of the Thornicroft Drain and provides fish community data for the 3080 Bostwick – Block 7, 8, and 9

subject lands. All fish collected were identified, enumerated, and released live shortly after capture.

In order to sample fish using electroshocking equipment, a *License to Collect Fish for Scientific Purposes* was obtained from the MNRF. This license was issued to NRSI on June 14, 2019, by the MNRF Aylmer District Office (No. 1093402).

4.0 Existing Conditions

4.1 Soils, Terrain and Drainage

The study area lies within the Upper Thames River watershed, which falls under the jurisdiction of the UTRCA. The Upper Thames watershed is 3,420km² (UTRCA 2017) and contains 28 subwatersheds. The Dingman Creek subwatershed, where the study area is located, contains many significant groundwater recharge areas and highly vulnerable aquifers. The woodland to the south of the subject lands and a portion of the treed area along the Thornicroft Drain have been mapped as containing a Significant Groundwater Recharge Area (UTRCA 2017).

The Thornicroft Drain, a permanent watercourse that flows in a north to south direction, bisects the subject lands. Previous surveys have found the Thornicroft Drain to have either a cool-warmwater thermal regime (Parsons 2019) or coolwater thermal regime (UTRCA 2017).

The study area lies primarily within the Ingersoll till plains and till moraine. The surficial geology of the site is characterized by fine textured clay to silt till derived from glaciolacustrine deposits (OGS 2010). Soils are characterized as Huron Clay Loam in the northern portion of the site and Guelph Loam in the southern portion; both soil types exhibiting moderate to imperfect surface drainage (Hagerty & Kingston 1992).

The overall topography of the subject lands is relatively flat, with a gradual decline toward the central watercourse and the woodland to the south of the subject lands.

NRSI identified one wetland, directly to the south of the subject lands. The wetland is palustrine and associated with the watercourse or headwater drainage features leading to the watercourse. Previous environmental studies carried out by Stantec identified an impacted shallow marsh meadow dominated by Common Reed (*Phragmites australis ssp. australis*) present to the north of the subject lands created as a result from poor drainage and retention of overland flow due to the presence of fill piles and poor grading.

4.2 Designated Natural Areas

Information on designated natural areas (ANSI's, ESA's, etc.), was obtained from the UTRCA, NHIC (MNR 2025), the London Plan (City of London 2026), the Dingman Creek Subwatershed Study (Delcan Corporation 2005), the Natural Heritage Systems Study (UTRCA 2014), and the Dingman Creek Subwatershed Stormwater Servicing Study (Aquafor Beech 2020).

Based on the Woodland Evaluation completed in support of the Kilbourne Lands SLSR and EIS, NRSI has identified the woodland to the south as significant (NRSI 2021, 2026). Similarly, the valleyland to the east of the subject lands associated with the Thornicroft Drain are designated as Significant Valleyland by the City of London, see Map 1.

4.3 Vegetation

4.3.1 Vegetation Communities

The subject lands consist of row crop agricultural fields and active development area with a north-south water course bisecting the lands. The watercourse is bordered by a narrow row of trees to the north of the subject lands, while a larger woodland community is present adjacent to the watercourse within the subject lands. A large forest is present to the south of the subject lands and is contiguous with the woodlands adjacent to the watercourse, this forest contains a mixture of forest and swamp communities. A detailed description of ELC communities identified within the study area is provided in Table 2 and shown on Map 3.

Table 2. Vegetation Communities Identified within the Study Area

ELC Ecosite Type	ELC Description	Environmental Characteristics
Cultural		
CUM1	Mineral Cultural Meadow	Cultural meadow present within the study area is associated with recently fallow fields which had been in row crop agriculture and have begun to succeed to natural habitat. The groundcover is dominated by Smooth Brome (<i>Bromus inermis</i>) with Tall Goldenrod (<i>Solidago altissima</i>), Wild Teasel (<i>Dipsacus fullonum</i>) and Tufted Vetch (<i>Vicia cracca</i>) common throughout. Willow saplings (<i>Salix amygdaloides</i> and <i>S. eriocephala</i>) have begun to establish in wetter areas with European Buckthorn (<i>Rhamnus cathartica</i>), Multiflora Rosa (<i>Rosa multiflora</i>), and Black Raspberry (<i>Rubus occidentalis</i>) common along fencelines and forest edges. A sedge that is rare in Middlesex county, Larger Straw Sedge (<i>Carex normalis</i>) is found along the southern edge of the cultural meadow habitat in proximity to the woodlands and wetlands to the south.
CUW	Cultural Woodland	An area of cultural woodland is present within the central portion of the subject lands, adjacent to the Thornicroft Drain. This area exists as a sparse stand of Black Walnut with some meadow vegetation established among predominantly cool season grasses.
Wetland		
SWD2-2	Green Ash Mineral Deciduous Swamp	The woodland to the south of the subject lands contains 2 Green Ash (<i>Fraxinus pennsylvanica</i>) swamp communities that collect and convey surface water in an easterly direction toward Thornicroft Drain. One of these swamp communities is located immediately to the south of the subject lands. Most of the Green Ash have been affected by Emerald

ELC Ecosite Type	ELC Description	Environmental Characteristics
		Ash Borer (<i>Agrilus planipennis</i>) resulting in the decline of mature trees and increased cover of herbaceous species due to the gaps in the tree canopy. The groundcover includes Fowl Meadow Grass (<i>Glyceria striata</i>), Sensitive Fern (<i>Onoclea sensibilis</i>), and Devil's Beggar-ticks. Both Cardinal-flower (<i>Lobelia cardinalis</i>) and Brookweed (<i>Samolus parviflorus</i>) occur in these wetlands and are rare in Middlesex County (Oldham 2017).
Forest		
FOD6-5	Fresh – Moist Sugar Maple – Hardwood Deciduous Forest Type	A large portion of the forest to the south is a mid-age to mature Sugar Maple Forest with American Basswood (<i>Tilia americana</i>), Bitternut Hickory (<i>Carya cordiformis</i>), Red Oak (<i>Quercus rubra</i>), American Beech (<i>Fagus grandifolia</i>), Black Cherry (<i>Prunus serotina</i>), and Hop Hornbeam (<i>Ostrya virginiana</i>) present throughout. The shrub layer of Chokecherry (<i>Prunus virginiana</i>) and limited tree regeneration is sparse and reflects a history of livestock grazing. The groundcover includes a diversity of spring ephemerals such as Yellow Dog's-tooth Violet (<i>Erythronium americanum</i>), Virginia Spring Beauty (<i>Claytonia virginica</i>), Woolly Blue Violet (<i>Viola sororia</i>), and 9 different species of sedges – high diversity for a feature of this size. Several species which are rare in Middlesex County occur within this feature including Clear Springweed (<i>Pilea fontana</i>) and Gray's Sedge (<i>Carex grayi</i>). The Bostwick EA (Parsons 2019) had not identified wetlands within this feature; however, 2 Green Ash swamps (SWD2-2) were mapped and field-verified with agency staff in 2019.
FOD7-4	Fresh – Moist Black Walnut Lowland Deciduous Forest	The eastern portion of the woodland to the south of the subject lands transitions from a high diversity forest toward a lower diversity stand of Black Walnut (<i>Juglans nigra</i>) with occasional Eastern Cottonwood (<i>Populus deltoides</i>) and American Basswood. A small portion of this community overlaps with the subject lands. This area was likely cleared within the last 50 years as the Black Walnut is mid-age and very few other tree species are present. The juglone emitted from the trees has limited the establishment of groundcover to common species such as White Avens (<i>Geum canadense</i>), Black Raspberry, and Garlic Mustard (<i>Alliaria petiolata</i>). This ELC type is considered significant by the NHIC (OMNR 2000).
FOD8-1	Fresh – Moist Poplar Deciduous Forest	The western portion of the woodland associated with the Thornicroft Drain, within the subject lands is dominated by Eastern Cottonwood with occasional Black Walnut. This community is a mid-aged bottomland forest. The shrub layer contains abundant Black Raspberry, with occasional Glossy Buckthorn and Gray Dogwood. The groundcover includes abundant Dame's Rocket (<i>Hesperis matronalis</i>), avens species, and Orchard Grass (<i>Dactylis glomerata</i>).

4.3.2 Vascular Flora

A 3-season vegetation inventory was conducted with a total of 116 species recorded by NRSI biologists. An additional 155 species of plants were documented within the study area by Parsons (2019) and 159 by Stantec (2020). Over the course of all field studies by the three firms, a total of 272 vascular plant species were observed within the broader study area. However, these observations are based on a broader study area, and species observed by Parsons and Stantec may fall beyond the boundary of the 3080 Bostwick study area. A complete list of these species is attached to this report (Appendix III).

Background information and the Protected Species and SCC screening that was conducted in preparation of this report indicated that two significant plant species, Butternut (*Juglans cinerea*) and Green Dragon (*Arisaema dracontium*) are known from the study area (MECP 2024) (Appendix I). Surveys included concentrated effort to look for this species along the watercourse; however, this species was not found and habitat along the watercourse appeared only moderately suitable. One additional Protected Species, Black Ash was reported from background information provided by Parsons (2019). This species is discussed in further detail below.

In addition, four plant species considered to be regionally rare were observed within the study area. These are listed in Table 3 and their locations shown on Map 4.

Table 3. Locally Rare Vegetation Observed within Study Area

Common Name	Scientific Name	SRANK ¹	COSSARO ¹ /COSEWIC ¹	County Status ²	ELC Community
Larger Straw Sedge	<i>Carex normalis</i>	S4	-	R	CUM1
Gray's Sedge	<i>Carex grayi</i>	S4	-	U	FOD6-5
Spring Clearweed	<i>Pilea fontana</i>	S4	-	R	FOD6-5
Seaside Brookweed	<i>Samolus parviflorus</i>	S4	-	R	SWD2-2

¹MNR 2025, ²Oldham 1993/Oldham 2017

Legend					
SRank		COSSARO/COSEWIC		Middlesex County Status	
S5	Secure	END/E	Endangered	X	Native and present
S4	Apparently secure	THR/T	Threatened	U	Uncommon
S2	Imperiled	SC	Special Concern	R	Rare and native
S#?	Rank uncertain				

Black Ash

Black Ash is a Protected Species in Ontario listed as Endangered provincially (SCA 2025). Black Ash does not currently has a status under the SARA (Government of Canada 2026). A Black Ash was documented from the forest located to the south of the subject lands. The specific location of the Black Ash was not documented, and this individual was not observed by NRSI during the completion of field work. It is anticipated that the Black Ash may have been in decline as a result of Emerald Ash Borer (*Agilus planipennis*), dying before field work was undertaken by NRSI. Further to this, the forest associated with the observation by Parsons will be retained in its entirety. Based on these considerations, Black Ash is not discussed further in this report.

4.4 Wildlife

4.4.1 Birds

A total of 90 species are reported from the vicinity of the study area based on the OBBA (BSC 2020). The OBBA data includes those species that have been observed from within a 10 x 10km square that overlaps the study area and are known to breed in the area. A total of 23 species were documented within the study area during the field surveys by NRSI biologists. An additional 25 species were documented from the study area by Stantec (2020) and Parsons (2019). Refer to Appendix II for a list of these species.

Of the 44 bird species documented from the study area, only 2 species, Wild Turkey (*Meleagris gallopavo*) and Baltimore Oriole (*Icterus galbula*), had confirmed breeding within the study area. Parsons (2019) identified confirmed breeding evidence of these species within the woodland to the south of the subject lands. A total of 5 species exhibited signs of probable breeding, such as observed pairs or birds on territory. A total of 14 species exhibited possible breeding including singing males or birds within suitable nesting habitat. A total of 23 showed no signs of breeding within the study area (fly-overs or migrants). The Stantec EIS (2020) made no distinction of locations of observations nor breeding evidence, and therefore data could only be interpreted as observations (OB) within a broader study area. The highest diversity was recorded from within the woodland directly south of the subject property.

Background information and Protected Species and SCC screening indicated that 10 significant bird species are reported from within the study area (Appendix I). NRSI observed only one of these significant species during field surveys: Eastern Wood-Pewee (*Contopus virens*). Red-headed Woodpecker (*Melanerpes erythrocephalus*) was also documented exhibiting possible

breeding evidence from the Stantec EIS (2020) within the woodland directly south of the subject lands. Additionally, Barn Swallow (*Hirundo rustica*) was also observed on the subject lands by Stantec (2020); however, no breeding evidence was documented for this species.

Eastern Wood-Pewee

Eastern Wood-Pewee is listed as Special Concern by COSSARO and federally under the SARA (COSSARO 2026, Government of Canada 2026). Eastern Wood-Pewee was documented by NRSI on all three breeding bird surveys dates in 2019. This species was consistently heard vocalizing from station BSS-001 from the forest to the south of the subject lands. The observed behaviour was consistent with an individual on territory and was considered Probable breeding evidence.

Barn Swallow

Barn Swallow is listed as Special Concern by COSSARO and Threatened federally under the SARA (COSSARO 2026, Government of Canada 2026). Barn Swallow was documented within the study area during surveys conducted by Stantec (2020). A total of six individuals were observed across the survey period; all Barn Swallow were observed foraging over the meadow community within the study area to the north of the subject lands. No breeding evidence was documented for the species, as structures conducive to breeding are not located on the subject lands. Stantec notes that farm is present on the west side of Bostwick Road and contains buildings that provide suitable habitat for breeding by the species. As no breeding evidence or habitat is present on the subject lands, it has not been discussed further in this report.

Red-headed Woodpecker

Red-headed Woodpecker is listed as Endangered by COSSARO and federally under the SARA (COSSARO 2026, Government of Canada 2026). As such the species and its residence are provided protection under the SARA or as SWH, if identified. Red-headed Woodpecker occupies diverse forest habitats including deciduous forests with little understorey, wooded swamps, orchards, small woodlots and forest edges. The species requires decadent trees with a DBH of at least 40 cm for nesting (MECP 2024).

During breeding bird surveys in 2020, Stantec biologists observed two Red-headed Woodpecker individuals within the forest to the immediate south of the subject lands. Based on these observations, Possible breeding evidence was documented for the species. The Stantec EIS notes that potentially suitable breeding habitat is present within the woodlands on-site and

to the south of the subject lands. As only Possible breeding evidence was documented by Stantec, with no additional specifics about the observations provided it is not possible to confirm the presence of habitat for the species. Based on an observation of Possible breeding evidence, SWH for Red-headed Woodpecker has not been identified in the vicinity of the subject lands. No nests, or residences of the species were documented during field surveys. Red-headed Woodpecker is not discussed further in this report.

4.4.2 Migratory Birds

A total of 11 species were documented from BSS-001 during the migratory bird survey. All species are common and typical of a forest and agricultural landscape. The survey generally did not document an abundance of migratory species with no warbler species recorded.

4.4.3 Herpetofauna

According to the Ontario Reptile and Amphibian Atlas (Ontario Nature 2019), 25 species of herpetofauna are reported from within 10km of the subject lands. Surveys conducted by NRSI biologists confirmed the presence of 5 species within the study area. A complete list of herpetofauna reported from the study area, based on background information and observations made as part of this study, is included in Appendix II. One additional herpetofauna species was observed by Parsons (2019) or Stantec (2020) during their assessments within the study area.

Background information and the Protected Species and SCC screening indicated that 6 significant herpetofauna species are known from within the study area (Appendix I). One of these species, Western Chorus Frog (*Pseudacris triseriata* pop. 2), was documented from the study area by NRSI biologists during the 2019 targeted surveys. Additionally, a single road mortality Snapping Turtle (*Chelydra serpentina*) was observed along Bostwick Road, within the project study area, during the site visit conducted by NRSI in August 2025. No significant herpetofauna species were documented within the Parsons EA (2019) or Stantec EIS (2020).

Anuran Call Surveys

Anuran call surveys were conducted to identify the presence of breeding frog and toad species within and adjacent to the subject lands. Table 4 presents the NRSI anuran call survey results.

Table 4. Anuran Call Survey Results

Station	Date (2019)	Call Abundance (Number of Individuals) *	
		Spring Peeper	Western Chorus Frog
ANR-006	April 9	--	--

Station	Date (2019)	Call Abundance (Number of Individuals) *	
		Spring Peeper	Western Chorus Frog
	May 16	1(1)	1(2)
	June 12	--	--

*Call abundance refers to the Marsh Monitoring Programs call codes (Bird Studies Canada 2009).

Evening anuran call surveys conducted by NRSI documented Spring Peeper (*Pseudacris crucifer*), and Western Chorus Frog. All species were documented from within the woodland and associated swamp community (SWD2-2) to the south of the subject lands and the riparian habitat along Thornicroft Drain. The presence of amphibians within the Thornicroft Drain corridor suggests that this feature is important for anuran movement between features (and the larger Dingman Creek watershed).

American Bullfrog (*Lithobates catesbeianus*) and Northern Leopard Frog (*Lithobates pipiens*) were also documented from the vicinity of the study area by Parson (2019) and Stantec (2020). Anuran surveys conducted to the north of the subject property by Parsons identified limited numbers of calling amphibians, restricted to only 2 species, Spring Peeper and Northern Leopard Frog (Stantec 2020). These habitats were observed to be highly disturbed and primarily a result of poor drainage associated with deposits of fill.

Western Chorus Frog

Western Chorus Frog, Great Lakes / St. Lawrence – Canadian Shield Population, is listed a Threatened federally, but has not provincial status. As such, habitat for the species is addressed as SWH. Two Western Chorus Frogs were heard vocalizing from the SWD2-2 community to the south of the subject lands during an anuran call survey conducted by NRSI. Based on this observation the SWD2-2 wetland provides suitable breeding habitat for the species.

Snakes

Two snake species were observed within the study area during NRSI's 2019 surveys: Eastern Gartersnake (*Thamnophis sirtalis sirtalis*) and Northern Brownsnake (*Storeria dekayi dekayi*). Data collected during coverboard surveys indicated snake presence at 1 of 2 locations. However, subsequent surveys after coverboard placement failed to detect the location of SNK-014 as it went missing shortly after placement.

SNK-015, at the northern edge of the woodland recorded at least 5 individuals (1 Eastern Gartersnake and 4 Northern Brownsnake). Given that many of the observations were made in

late April and early May, shortly after snake emergence, and the presence of an old, it is probable that snake hibernacula is present. Hibernacula sites are considered SWH and are warranted a 30m buffer surrounding the feature (in this case the abandoned well which is located in the core of the large forest south of the subject property.

4.4.4 Mammals

According to the Mammal Atlas of Ontario (Dobbyn 1994) and additional background sources, 47 mammal species are reported from within 10km of the subject lands. During the various field surveys, four of these species were observed within the study area, with one additional species documented by Parsons in 2019. Mammal species documented within the study area during the various surveys included: Eastern Cottontail (*Sylvilagus floridanus*), Woodchuck (*Marmota monax*), Gray Squirrel (*Sciurus carolinensis*), Raccoon (*Procyon lotor*), and White-tailed Deer (*Odocoileus virginianus*). Parsons also observed evidence of Coyote (*Canis latrans*) within the southern portion of the study area. Appendix II provides a complete list of mammal species reported from the study area.

Appendix I provides summaries of significant mammal species reported from the vicinity of the study area, their current status ranks, and preferred habitats. Based on field work conducted, none of these species were documented from the study area; however, suitable habitat is present for Protected Species bats in treed and vegetated areas of the study area.

4.4.5 Insects

Butterflies

According to the Ontario Butterfly Atlas (MacNaughton et al. 2025), 69 butterfly species are reported from the study area including 3 provincially rare species (Appendix II). NRSI biologists observed 7 butterfly species during surveys within the study area including Black Swallowtail (*Papilio polyxenes*), Cabbage White (*Pieris rapae*), Clouded Sulphur (*Colias philodice*). Common Ringlet (*Coenonympha tullia*), Monarch (*Danaus plexippus*), Northern Crescent (*Phyciodes cocyta*), and Orange Sulphur (*Colias eurytheme*). Stantec and Parsons identified an additional 7 species within the vicinity of the study area. Butterfly observations were concentrated along forest and field edges and in areas of cultural meadow.

The Protected Species and SCC screening (Appendix I) provides a summary of the 4 significant butterfly species reported in the study area vicinity, their current status ranks, and preferred habitats. Monarch is considered Special Concern provincially and was the only significant

butterfly species documented from the study area during the 2019 surveys. No other significant insect species were documented within the study area.

Monarch

Monarch is listed as Special Concern by COSSARO and Endangered federally under the SARA (COSSARO 2026, Government of Canada 2026). As such, the species is not regulated, but its habitat may be protected as SWH. As many as 3 individuals were observed at one time along field edges and in cultural meadow areas where Common Milkweed (*Asclepias syriaca*) is occasional and a variety of nectar plants, both agricultural weeds as well as asters and goldenrods, are present. Areas containing large amounts of Milkweed (*Asclepias* spp.) and nectaring plants are considered SWH. Based on the vegetation surveys and the observation of only 3 Monarch butterflies within suitable nectaring habitat, SWH for Monarch is not present within the study area. As SWH is not present, Monarch is not discussed further in this report.

Odonata

Information obtained from the Ontario Odonata Atlas Database (OOAD 2023) indicates that 34 species of dragonfly and damselfly are known from the study area including 5 SCC (Appendix II). NRSI biologists documented 4 common species from the study area: Common Green Darner (*Anax junius*), Twelve-spotted Skimmer (*L. pulchella*), Lance-tipped Darner (*Aeshna constricta*), and Black Saddlebags (*Tramea lacerata*). Most of the odonate observations were noted in the vicinity of the watercourse and riparian habitat as well as along the edges of agricultural fields and in areas of cultural meadow.

4.4.6 Additional Wildlife

During NRSI's 2019 surveys, Terrestrial Crayfish chimneys were observed within the woodland to the south of the subject lands, in the vicinity of the Green Ash swamp community. Additional chimneys were also observed during the wetland delineation within the main area of the Green Ash swamp community. These areas are indicated on Map 4. The chimneys within wetland communities associated with the southern woodland were also documented within the Bostwick EA (Parsons 2019).

4.5 Aquatic Habitats and Species

4.5.1 Headwater Drainage Feature Assessment

Each segment of the 4 HDFs within the study area were evaluated based on the 4 assessment steps outlined in the Headwater Guideline (TRCA and CVC 2014). The Headwater Guideline

provides descriptions and recommendations for each management type identified in Table 5. The management descriptions from the Headwater Guideline (TRCA and CVC 2014) are provided in Appendix X.

The results from the evaluation are summarized in Table 5 and the location of the HDFs are shown on Map 3.

Table 5. Headwater Drainage Feature Existing Conditions and Management Evaluation

Drainage Feature Segment	Step 1		Step2	Step 3	Step 4	HDF Guidelines Management
	Hydrology	Modifiers	Riparian	Fish Habitat	Terrestrial Habitat	
TDT 10-1	Recharge Function The reach was dry during all three visits. Site was identified as a natural channel, an ill-defined channel as evidence from past flows. This reach is identified as Significant Groundwater Recharge Area	None	Important Function Riparian corridor is dominated by Deciduous Forest.	Contributing Function Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain. Recharge features typically do not transport any material; however, large precipitation events may transport sediment.	Limited Functions Naturalized vegetation is present in the feature and its riparian corridor. However, it does not provide meaningful connection to or from other habitats.	Maintain Recharge
TDT 10-2	Limited Function Feature had standing water during the 1 st visit and was dry during the 2 nd and 3 rd visits. Site was identified as a swale.	Agricultural land is tile drained.	Limited Function Riparian corridor dominated by agricultural row crop.	Contributing Function Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain	Limited Function Naturalized vegetation is not present in the feature and its riparian corridor, and does not provide meaningful connection to or from other habitats used by wildlife.	No Management Required
TDT 11-1	Valued Function Feature was minimally flowing during the 1 st and 2 nd site visits, and	None	Important Function Riparian corridor is dominated by Deciduous Forest.	Contributing Function Direct fish habitat is not present. Feature supplies	Valued Functions Naturalized vegetation is present in the riparian corridor	Protection

Drainage Feature Segment	Step 1		Step2	Step 3	Step 4	HDF Guidelines Management
	Hydrology	Modifiers	Riparian	Fish Habitat	Terrestrial Habitat	
	was surface damp by the 3 rd visit. Site was identified as a natural channel.			allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain.	that connects to wetlands upstream. The feature may function as stepping stone habitat for low-mobility wildlife (e.g. amphibians).	
TDT 11-2	Valued Function Feature was minimally flowing during the 1 st and 2 nd site visits, and was surface damp by the 3 rd visit. Site was identified as a natural channel.	None	Important Function Riparian corridor is dominated by Deciduous Forest.	Contributing Function Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain.	Valued Functions Naturalized vegetation is present in the riparian corridor that connects to wetlands upstream. The feature may function as stepping stone habitat for low-mobility wildlife (e.g. amphibians).	Protection
TDT 11-3	Valued Function Feature was minimally flowing during the 1 st and 2 nd site visits, and was surface damp by the 3 rd visit. Site was identified as a natural channel.	None	Important Function Riparian corridor is dominated by Deciduous Swamp (wetland).	Contributing Function Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain.	Valued Functions Naturalized vegetation is present in the riparian corridor that connects to wetlands upstream. The feature may function as stepping stone habitat for low-mobility wildlife (e.g. amphibians).	Protection

Drainage Feature Segment	Step 1		Step2	Step 3	Step 4	HDF Guidelines Management
	Hydrology	Modifiers	Riparian	Fish Habitat	Terrestrial Habitat	
TDT 11-4	Valued Function Feature was minimally flowing during the 1 st and 2 nd site visits, and was surface damp by the 3 rd visit. Site was identified as a wetland.	None	Important Function Riparian corridor is dominated by Deciduous Forest.	Contributing Function Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain.	Important Functions The feature is a wetland and a calling Spring Peepers and one Gray Treefrog were heard during second anuran call survey.	Protection
TDT 11-5	Valued Function Feature was minimally flowing during the 1 st and 2 nd site visits, and was surface damp by the 3 rd visit. Site was identified as a natural channel.	None	Important Function Riparian corridor is dominated by Deciduous Swamp and Forest.	Contributing Function Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain.	Valued Functions Naturalized vegetation is present in the riparian corridor that connects to wetlands upstream. The feature may function as stepping stone habitat for low-mobility wildlife (e.g. amphibians).	Conservation
TDT 12-1	Contributing Function Feature was minimally flowing during the 1 st visit, standing water during the 2 nd visit, and was surface damp by the 3 rd visit. Site was identified as a swale.	None	Important Function Riparian corridor is dominated by Deciduous Forest.	Contributing Function Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain.	Contributing Functions Naturalized vegetation is present within the riparian corridor. The feature may function as a stepping stone habitat for low-mobility wildlife (e.g. amphibians).	Conservation

The classification results of the HDF assessment are summarized in Table 5, and the management recommendations for each reach are shown on Map 3. The Headwater Guideline framework utilizes the following outcomes as potential management recommendations:

- Protection – the feature serves an important function to all criteria
- Conservation – the feature serves a valued function to all criteria
- Mitigation – the feature serves a contributing function to all criteria
- Recharge protection – the feature serves a groundwater recharge function in which flow is absent over sandy or gravelly soils
- Maintain or replicate terrestrial linkage – for features with terrestrial function only
- No management required – for features with limited or no function

Descriptions of the recommended management options for each category are provided below. Modifiers in Table 5 reflect local details that alter the form, function, or importance of the feature, such as active agriculture and tiling. The management recommendations identified via strict application of the Headwater Guideline decision matrix have been adjusted to account for the modifiers and other site conditions not captured by the Guideline. The Headwater Guideline allows for these modifications through the following statement: “Classification should consider the influence of modifiers and professional judgement to determine the appropriate classification, where applicable. The results of the process need to be clearly articulated within the table” (TRCA and CVC 2014).

As shown in Table 5, the reaches within the study area have management recommendations of ‘Protection’, ‘Conservation’, ‘Mitigation’, ‘Maintain Recharge’, and ‘No Management Required’. The Mitigation management results were largely focused on the hydrology of the features, rather than their limited ecological function.

The Headwater Guideline provides descriptions for each of these management recommendations, as directly quoted below (TRCA and CVC 2014):

- Protection – Important Functions: e.g. swamps with amphibian breeding habitat; perennial headwater drainage feature; seeps and springs; SAR habitat; permanent fish habitat with wood riparian corridor.
 - Protect and/or enhance the existing feature and its riparian zone corridor, and groundwater discharge or wetland in-situ;

- Maintain hydroperiod;
 - Incorporate shallow groundwater and base flow protection techniques such as infiltration treatment;
 - Use natural channel design techniques or wetland design to restore and enhance existing habitat features; if necessary, realignment not generally permitted;
 - Design and locate the stormwater management system (e.g. extended detention outfalls) are to be designed and located to avoid impacts (i.e. sediment, temperature) to the feature.
- Conservation – Valued Functions: e.g. seasonal fish habitat with woody riparian cover; marshes with amphibian breeding habitat; or general amphibian habitat with woody riparian cover.
 - Maintain, relocate, and/or enhance drainage feature and its riparian zone corridor;
 - If catchment drainage has been previously removed or will be removed due to diversion of stormwater flows, restore lost functions through enhanced lot level controls (i.e. restore original catchment using clean roof drainage), as feasible;
 - Maintain or replace on-site flows using mitigation measures and/or wetland creation, if necessary;
 - Maintain or replace external flows,
 - Use natural channel design techniques to maintain or enhance overall productivity of the reach; and,
 - Drainage feature must connect to downstream.
 - Mitigation – Contributing Functions: e.g. contributing fish habitat with meadow vegetation or limited cover.
 - Replicate or enhance functions through enhanced lot level conveyance measures, such as well-vegetated swales (herbaceous, shrub and tree material) to mimic online wet vegetation pockets, or replicate through constructed wetland features connected to downstream;
 - Replicate on-site flow and outlet flows at the top end of system to maintain feature functions with vegetated swales, bioswales, etc. If catchment drainage has been previously removed due to diversion of stormwater flows, restore lost

- functions through enhanced lot level controls (i.e. restore original catchment using clean roof drainage); and,
- Replicate functions by lot level conveyance measures (e.g. vegetated swales) connected to the natural heritage system, as feasible and/or Low Impact Development (LID) stormwater options (refer to Conservation Authority Water Management Guidelines for details).
 - Recharge Protection – Recharge Functions: e.g. features with no flow with sandy or gravelly soils;
 - Maintain overall water balance by providing mitigation measure to infiltrate clean stormwater, unless the area qualifies as a Significant Recharge Areas under the Source Water Protection Act. These areas will be subject to specific policies under their respective legislation.
 - Terrestrial features may need to be assessed separately through an Environmental Impact Study to determine whether there are other terrestrial functions associated with them.
 - No Management Required – Limited Functions: e.g. features with no or minimal flow; cropped land or no riparian vegetation; no fish or fish habitat; and no amphibian habitat.
 - The feature that was identified during desktop pre-screening has been field verified to confirm that no features and/or functions associated with headwater drainage features are present on the ground and/or there is no connection downstream. These features are generally characterized by lack of flow, evidence of cultivation, furrowing, presence of a seasonal crop, and lack of natural vegetation. No management recommendations required.

4.5.2 Benthic Invertebrate Sampling

A total of 18 different taxa were identified across the two sampling stations within Thornicroft Drain as part of the 2019 benthic macro-invertebrate sampling. These taxa represent 11 different families and 7 orders of benthic macro-invertebrates. Survey results are summarized for stations BTH-001 and BTH-002 in Table 6 and Table 7 and discussed below.

Table 6. 2019 Qualitative Benthic Macro-Invertebrate Metrics

Benthic Macro-Invertebrate Metrics	BTH-001	BTH-002
Diversity and Biotic Indices		
Family Biotic Index	7.48	6.62
Family Biotic Index Water Quality	Very Poor	Poor
Biotic Index	7.24	6.56
Biotic Index Water Quality	Fairly Poor	Fairly Poor
Functional Feeding Groups		
% Collector-Filter	13.95	3.85
% Collector-Gatherer	59.88	50.85
% Predators	18.02	37.61
% Scrapers	0.00	0.00
% Shredders	8.14	7.69

Qualitative benthic macro-invertebrate metrics (Table 6) suggest a relatively impaired watercourse dominated by a few highly tolerant species. The Hilsenhoff Biotic Index and Family Biotic Index suggests a “Very Poor” to “Fairly Poor” environmental water quality, similar to the conditions seen as part of the 2016 BioMAP water quality report completed by StraightUp Environmental Consulting (2016) as part of the Bostwick EA (Parsons 2019) where the Family Biotic Index fell within the “Fairly Poor” range suggesting substantial organic pollution and falling within the general “Potentially Impaired” assessment range. Overall, the dominant functional feeding group within both monitoring stations in 2019 were Collector-Gatherers (c-g) comprising 50.85 – 59.88% of the samples with the sub-dominant functional feeding group comprising 18.02 – 37.61% the samples.

Table 7. 2019 Quantitative Benthic Macro-Invertebrate Metrics

Benthic Macro-Invertebrate Metrics	BTH-001	BTH-002
Taxa Richness	11	14
Density (specimens/m ²)	645.16	488.76
Sensitive Taxa		
EPT Richness	0	0
% EPT	0.00%	0.00%
Tolerant Taxa		
% Oligochaetes	0.00%	0.00%
% Diptera	98.48%	98.00%
% Chironomidae	98.48%	97.33%
% Gastropoda	0.00%	0.00%
Diversity		
Shannon Wiener Index	1.64	1.64

Simpson's Diversity	0.80	0.79
BioMAP Water Quality		
BioMAP Water Quality	4.43	4.45

As seen in Table 7, taxonomic richness was relatively consistent between monitoring stations, showing a marked decrease from 2016 sampling, falling within the “Potentially Impaired” range at monitoring station BTH-001 and within the “Potentially Unimpaired” range at BTH-002. Both taxonomic richness and proportion of sensitive *Ephemeroptera* (Mayfly), *Plecoptera* (Stonefly), and *Trichoptera* (Caddisfly) (i.e. EPT) taxa did not indicate the presence of any sensitive taxa from Thornicroft Drain as part of 2019 benthic macro-invertebrate community sampling, suggesting a “Potentially Impaired” aquatic environment. The high proportion of tolerant taxa, *Diptera* and *Chironomidae* predominantly, further suggest “Potentially Impaired” aquatic habitat within Thornicroft Drain in the vicinity of the monitoring stations.

During the 2019 benthic sampling, the dominant and subdominant taxa were observed to be comprised of members of the highly tolerant taxa primarily members of the Family *Chironomidae* with no single group or taxa achieving true dominance within Thornicroft Drain.

Within monitoring station BTH-001:

- Dominant taxa was represented by the highly tolerant taxa *Chironomus* sp. (Tolerance 10) (Family *Chironomidae*).
- Sub-dominant taxa included the highly tolerant taxa *Natarsia* sp. (Tolerance 8) (Family *Chironomidae*)

Within monitoring station BTH-002:

- Dominant taxa was represented by the moderately tolerant taxa *Brilla* sp. (Tolerance 5) (Family *Chironomidae*).
- Sub-dominant taxa included members of the moderately tolerant *Lumbricidae* family (Tolerance 5)

The Shannon Wiener (H') Index measures diversity, taking into account the number of species and their evenness. H' Index results fall within the typical range of values of between 1.5 and 3.5 (Mac Donald 2003) for most stations. The H' Index ranged from 1.64 at BTH-001 to 2.28 at BTH-002 suggesting “Potentially Impaired” conditions within Thornicroft Drain. Simpson's Diversity ranged from 0.79 at BTH-001 to 0.88 at BTH-002 suggesting a relatively healthy diversity within the local benthic macro-invertebrate communities. The BioMAP water quality

index resulted in a water quality index of 4.43 at monitoring station BTH-001 and 4.45 at monitoring station BTH-002 falling within the “Impaired” range for creeks (<14), which is consistent with the results seen as part of the 2016 benthic macro-invertebrate community monitoring provided in the Bostwick EA (Parsons 2019).

4.5.3 Aquatic Habitat Assessment and Temperature Monitoring

Two aquatic habitat assessments were completed along Thornicroft Drain within the study area from south to north. NRSI aquatic biologists conducted these assessments on July 9 and July 10, 2019. Within the assessed sites (Map 2), Thornicroft Drain is consistently wetted with depths up to 150cm in select locations. The drain originates north of the property from a storm sewer, which during high flow events provides a significant amount of flow/velocity to the watercourse downstream. It flows southward through a naturalized channel for the full extent of the study area. Downstream of Southdale Road, the channel has historically been straightened. The channel has a relatively straight meander with a significant number of headwater inputs throughout its length. The feature contains riffles, runs, and pools which act as refuge to fish during dry periods.

Throughout the watercourse there are areas of significant erosion and steep banks denoting a significant quantity of water that is carried seasonally. The substrates range from silt to gravels but are predominantly silt and sand, with large deposits of silt in various locations. There were several debris jams at the time of assessment consisting of woody debris. One of the debris jams, which may have been a beaver dam at one point, has changed the habitat upstream. An increased quantity of fine sediments are being held back, and the watercourse was wider upstream of this location. The riparian corridor provides a great amount of shading to the watercourse. The low-lying areas around Thornicroft Drain show evidence of high flows, with debris littered up to the edge of the floodplain.

NRSI’s aquatic habitat assessment followed the same reaches where possible as outlined within the Bostwick EA (Parsons 2019). Our findings also matched the existing conditions as documented within the Bostwick EA (Parsons 2019).

The results of 2019 Thornicroft Drain water temperature and air temperature monitoring show a relatively consistent pattern of surface water temperatures across all monitoring stations (Figure 1), with characteristic variation in water temperatures associated with significant precipitation events. These results are to be expected from a system heavily influenced by surface water

runoff. The water temperature results are also highly reflective of the recorded daily air temperatures. These results are indicative of aquatic systems that are significantly influenced by upstream surface water inputs. However, some variation occurs across monitoring stations.

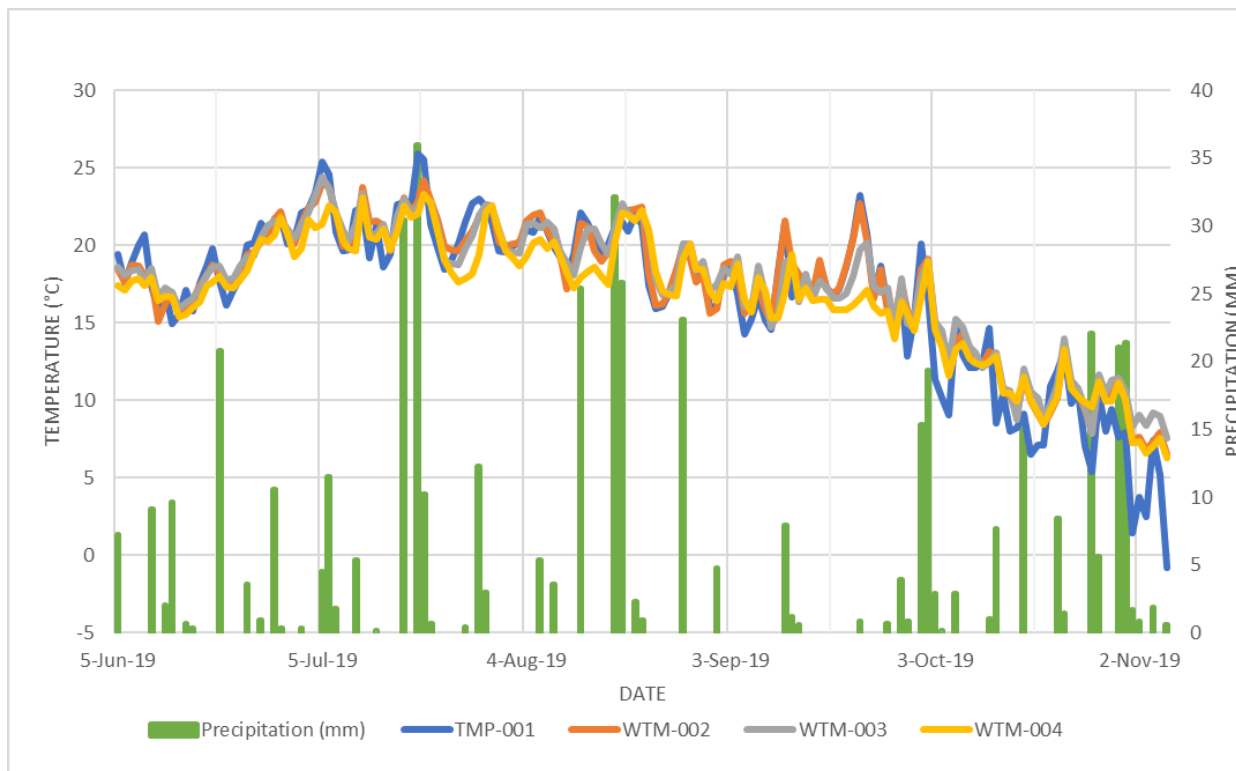


Figure 1. 2019 Surface Water Temperature Monitoring Thornicroft Drain

Baseline thermal regime determination suggests that the thermal regime within Thornicroft Drain falls within the “Warm-Cool” water thermal regime. This determination is in line with the “warm” designation in the Dingman Creek Subwatershed Study Update (2005), the “cool” designation in the Bostwick EA (Parsons 2019) and the “warm-cool” designation in the Dingman Creek Subwatershed Stormwater Study (Aquafor Beech 2020).

Fish habitat is present throughout the full extent of the watercourse within the study area. The debris barriers may act as a barrier to fish during low flow, but not during high water events.

4.5.4 Fish Community Sampling

The Canadian Fisheries Act, 1985, defines “fish” as including a) parts of a fish; b) *shellfish*, crustaceans, marine animals and any parts of shellfish, crustaceans or marine animals; and c) the eggs, sperm, spawn, larvae, spat and juvenile stages of fish, shellfish, crustaceans and marine animals. As such, fish, mussels, and Terrestrial Crayfish are discussed in this section.

Within Thornicroft Drain, 8 species of fish were collected during the sampling from the downstream extent and 2 species of fish were collected from the upstream extent within the study area. Species from EMS-002 located within the study area included Brook Stickleback and Creek Chub. A more diverse community was captured in downstream reaches outside the study area, including Blacknose Dace (*Rhinichthys obtusus*), Bluntnose Minnow (*Pimephales notatus*), Brook Stickleback (*Culea inconstans*), Central Stoneroller (*Campostoma anomalum*), Creek Chub (*Semotilus atromaculatus*), Fathead Minnow (*Pimephales promelas*), Pumpkinseed (*Lepomis gibbosus*), and White Sucker (*Catostomus commersonii*).

The species collected are representative of a cool to warmwater fish community. This is similar to the results from the Bostwick EA (Parsons 2019) and the UTRCA's statements within the Dingman Creek Subwatershed Study (2005). The only species reported from the area not captured during NRSI's 2019 sampling is Iowa Darter (*Etheostoma exile*).

Although not sampled, fish were observed immediately downstream of Southdale Road. No freshwater mussels were observed within Thornicroft Drain or its tributaries.

During field surveys conducted by NRSI in 2019, Terrestrial Crayfish chimneys were identified in the Green Ash swamp (SWD2-2) that it located just south of the subject lands' boundary. Habitat for Terrestrial Crayfish is afforded protection as SWH.

5.0 Significance and Sensitivity of Natural Features

The natural environment constraints analysis is used to identify natural heritage features that are sensitive to disturbance based on the rarity or significance of the feature or its functions/processes, and/or policies that prohibit development within them. These areas are identified as “development 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 subject property. 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. Each potential constraint is shown on Map 4. A summary of this analysis for the subject lands and study area is discussed below.

5.1 Wetlands

According to the background information collected, the North Talbot Wetlands (UT57) PSW complex is located approximately 900m to the west of the study area (MNR 2025).

A single wetland community was identified with the study area of the project; a Green Ash deciduous swamp (SWD2-2) is present to the south of the western portion of the subject lands within the large forest feature. This wetland is approximately 0.737ha in size. This wetland feature has not been formally evaluated through OWES; however, based on the size of the feature it would not be considered provincially significant. As stated in the London Plan, all wetland features, regardless of their size or designation, are subject to the Natural Heritage System policies and are protected (City of London 2025). EXP completed an assessment of hydroperiod within this wetland. The results of the wetland hydroperiod assessment are summarized below.

The SWD2-2 wetland within the study area receives surface water from the west side of Bostwick Road, as well as intermittent flow from the wetland near the southern edge of the forest, through a poorly defined swale that connects the two wetlands. Overland flows are also contributed from the western portion of the subject lands with flows traveling south into the wetland due to the topography of this area. This wetland directs surface water east into the Thornicroft Drain. Anuran call surveys documented Spring Peeper and Western Chorus Frog from this wetland. The wetland is relatively intact with limited evidence of disturbance, and a relatively high diversity of native plants, including several regionally significant species. This wetland begins retaining water in the fall and winter, reaching peak surface water levels in the late winter to early spring, before drying up in the summer. Based on these findings, the

wetland is fed by seasonal groundwater discharge and runoff, with no significant sustained year-round ponded water (EXP 2024). Given the quality of this wetland and its proximity to future development, it is considered sensitive to development-related impacts.

Development or site alteration on lands adjacent to the wetland is not permitted under the PPS or the London Plan unless it has been demonstrated that there will be no negative impacts on the natural feature or its ecological functions (OMMAH 2024, London Plan 2026).

5.2 Significant Woodlands

The London Plan (2026) and the City of London EMG (2025), recognize Significant Woodlands, as identified on Map 5 of the London Plan. The woodland to the south of the subject lands (Patch 10064) is considered a Significant Woodland, this is supported by the Kilbourne Lands EIS report prepared by NRSI (2026). The area of CUW and FOD8-1 within the subject lands that project out from the northeast side of the larger forest feature have also been treated as significant, see Map 4. This area is largely treated as significant by Stantec in their EIS (2020). This portion of the woodland is considered significant as it is contiguous with the Patch 10064 Significant Woodland. The treed boundary along the Thorncroft Drain that extends north from the FOD8-1 community outside the subject lands has not been treated as significant since in NRSI's opinion it does not constitute a woodland, this area is instead addressed as Significant Valleyland, below.

The extent of Significant Woodland within the subject lands is presented on Map 4.

5.3 Significant Valleyland

The London Plan (2026) identifies the full length of the Thorncroft Drain, within the study area, as Significant Valleyland. Significant Valleyland is identified as having a minimum width of 30m on each side of the watercourse measured from the high-water mark. For the purposes of this report the Significant Valleyland width has been mapped from the top of slope, which is expected to be contiguous or near contiguous with the high water mark. The Significant Valleyland is shown on Map 4.

5.4 Significant Wildlife Habitat

Based on the background information review, desktop analysis and field studies, 4 SWH types were confirmed within the study area, with two additional SWH types identified as candidate. Confirmed and candidate SWH types are shown on Map 4.

5.4.1 Seasonal Concentrations Areas

Bat Maternity Colony (Candidate)

Bat maternity (or nursery) colonies are day roosts inhabited solely by females and juveniles/sub-adults and are used for giving birth and raising young (OMNR 2011). Colonies can range in size from tens to hundreds of adult females and their young and some species form individual maternal roosts (OMNR 2011). Maternity colonies can be located in human structures (e.g., barns and attics), in tree cracks and hollows, and under loose tree bark.

Guidelines for identifying candidate significant bat maternity colony are outlined by the MNR (MNRF 2015) and the SWHTG (OMNR 2000). These documents outline that any deciduous or mixed forest communities should be assessed for cavity trees $\geq 25\text{cm}$ dbh (diameter at breast height) which may be suitable for roosting bats.

As targeted bat habitat surveys were not undertaken within the subject lands, and tree removals have not been proposed, all suitable FOD and SWD communities within the subject lands and study area have been identified as candidate Bat Maternity Colony SWH. Should future development propose vegetation removal that would impact any of these forest communities, targeted bat surveys may be required to inform whether or not the forests provide SWH as roost habitat.

Reptile Hibernaculum (Candidate)

Reptile hibernacula sites can include foundations, wells and bridge abutments where reptiles can access sub-terranean crevices for over-wintering. Congregations of snakes emerge from hibernacula in the early spring and are typically found basking in close proximity to the feature for a period following emergence.

Observations of several individuals of 2 snake species were documented from the snake coverboards along the edge of the southern woodland. An abandoned well appears to extend below the frost line is present in the woodland. Given the observation of numerous snakes in late April, shortly after emergence, it is very likely that this feature is being used to over-winter and therefore SWH is considered candidate. The SWHTG identifies that the SWH includes the feature plus a 30m buffer surrounding the feature, the location of this candidate SWH type is shown on Map 4.

5.4.2 Rare Vegetation Communities

Other Rare Vegetation Communities (Confirmed)

The Fresh – Moist Black Walnut Lowland Deciduous Forest (FOD7-4) community that comprises a portion of the Significant Woodland associated with the subject lands and is considered significant by the NHIC (OMNR 2000). This community is bisected by the Thornicroft Drain and partially overlaps the subject lands.

5.4.3 Specialized Wildlife Habitat

No Specialized Wildlife habitat types, which could include Turtle Nesting Areas or Amphibian Breeding Habitat, were documented from the subject lands.

5.4.4 Habitat for Species of Conservation Concern

Confirmed habitat for SCC may be considered SWH (OMNR 2000). Based on the results of wildlife-specific field surveys, Terrestrial Crayfish, and Special Concern and Rare Wildlife Species (Eastern Wood-pewee and Western Chorus Frog) SWH were confirmed within the study area.

Terrestrial Crayfish (Confirmed)

The Green Ash swamp (SWD2-2) community to the south of the subject lands was observed to contain Terrestrial Crayfish chimneys. As such, it has been identified as confirmed SWH. This SWH type often occurs in areas that undergo seasonal water inundation.

Eastern Wood-Pewee (Confirmed)

Habitat for Eastern Wood-Pewee includes the forests and woodlands within the subject lands and to the south of the subject lands, within the study area. Eastern Wood-Pewee will use both forest core areas of various sizes and forest edge habitat for nesting and show some fidelity to riparian habitats. The extent of SWH encompasses those treed areas which are likely to support breeding pairs. These areas are defined by the extent of the ELC polygon and are indicated on Map 4.

Western Chorus Frog (Confirmed)

Habitat for Western Chorus Frog has been identified within the SWD2-2 community within the significant woodland, to the immediate south of the subject lands. The Great Lakes / St. Lawrence – Canadian Shield Population of Western Chorus Frogs is federally Threatened. This species breeds in a variety of wetland habitats including temporary ponds, swamps and wet

meadows (OMNR 2000). Habitat for Western Chorus Frog within the study area includes this important breeding habitat, the extent of the species habitat is shown on Map 4.

5.4.5 Animal Movement Corridors

As surveys conducted in 2019 did not identify SWH for anuran breeding (wetland), the criteria for the Animal Movement Corridors SWH type was not fulfilled.

5.5 Habitat of Protected Species

Based on the background review and field investigations habitat for regulated SAR bats is likely present, but acoustic bat surveys were not undertaken in order to confirm species presence.

5.5.1 SAR Bats

Suitable roosting habitat for Little Brown Myotis, Northern Myotis, Tri-colored Bat, Silver-haired Bat, Hoary Bat, and Eastern Red Bat is present within and adjacent to the subject lands. Little Brown Myotis uses caves, quarries, tunnels, hollow trees, or buildings for roosting, and it feeds primarily in wetlands and forest edges (OMNR 2000). Northern Myotis roosts in houses and man-made structures, but prefers hollow trees or under loose bark, and it hunts within forests below the canopy (OMNR 2000). Tri-colored Bat prefers open woods near water; it roosts in trees, cliff crevices, buildings, or caves (OMNR 2000). Silver-haired Bat primarily roosts under exfoliating bark and in cavities of trees. This species will use both deciduous and coniferous forests and may occasionally roost in anthropogenic structures (COSEWIC 2023). Hoary Bat and Eastern Red Bat typically roost in the foliage of trees and will use both coniferous and deciduous habitats (COSEWIC 2023).

Based on guidance for treed habitats and areas (MECP 2022b), surveys for SAR bats are not needed if a proposed activity will avoid impairing or eliminating the function of habitat for supporting bat like processes, i.e. 1) if a proportionally small number of potential roost trees in treed habitats are to be removed and their removal will not result in fragmentation of habitat or barriers to habitat use by bats, and 2) if the timing of tree removal will avoid the bat active season (April 1 to November 30 in southern Ontario). The damage and destruction assessment varies geographically as the availability of other nearby maternity and day roost trees differs across the province of Ontario (MECP 2022b). Currently no vegetation removal is proposed within the treed areas of the subject lands. Should tree removals be proposed, an updated bat habitat assessment should be completed as part of the Draft Plan conditions, at the detailed

design stage, in order to determine if tree removals would be considered a “proportionally small” impact in the local landscape, or if further surveys will be required.

5.6 Fish Habitat

Direct fish habitat is present within the Thornicroft Drain, which is a permanent watercourse. Indirect fish habitat is present within one tributary/HDF is located within the Significant Woodland to the south of the subject lands.

The *Fisheries Act* protects fish and fish habitat (as identified within the Act) up to the high-water mark. Works within fish and fish habitat will need to ensure compliance with the *Fisheries Act*, and incorporate measures to protect fish and fish habitat. If all of the steps/measures can be followed, then further review by DFO is not required. However, if all steps and measures cannot be implemented completely, then a Request for Review must be initiated to DFO.

Thornicroft Drain and other watercourse/drainage features are regulated by the UTRCA according to Ontario Regulation 41/24 (Government of Ontario 2024). The UTRCA can prohibit or regulate the straightening, changing, diverting, or interfering in any way with the existing channel the creek. Development or interference within the 30m regulation limit may be permitted if, in the opinion of the UTRCA, the development will not affect the control of flooding, erosion, dynamic beaches, or unstable soil or bedrock.

Development and site alteration within watercourses and their associated fish habitat is prohibited except in accordance with provincial and federal requirements and where the habitat to provide for the life requirements of aquatic systems will not be reduced (City of London 2026).

5.7 Other Drainage Features

Although not shown on the London Plan mapping, HDF features (as show on Map 3 of this report) were assessed in Table 5. Based on this analysis, several HDF's within the study area warrant conservation or protection. While less restrictive, several of the HDF segments should have their terrestrial linkages maintained even if the flow is altered. The remaining HDF segments do not require any management. Map 3 shows the HDF segments within the study area and the colour-coded management guideline based on the analysis.

Four segments (TDT11-1, TDT11-2, TDT11-3, TDT11-4) within the study area warrant protection (red segments on Map 3) based on the analysis. The reaches associated with TDT11 are within the Significant Woodland to the south of the subject lands, and provide an

important function for riparian habitat, contributing function for downstream fish habitat within the Thornicroft Drain, and valued function in providing amphibian breeding habitat and wildlife movement habitat.

The other HDF segments within the Significant Woodland (TDT11-5 and TDT12-1) warrant conservation based on the analysis. These HDFs are all located within a Significant Woodland feature with wetland present.

5.8 Corridors and Linkages

Within the landscape context, the Thornicroft Drain and natural riparian cover associated with it are important for the movement of local wildlife. This connection will be maintained following development of the subject lands.

6.0 Ecological Buffers

Ecological buffers are required for natural heritage features such as woodlands, wetlands, and significant wildlife habitats to protect them from impacts during and after development. Properly functioning buffers protect natural features against sedimentation, erosion, provide attenuation of precipitation and run-off, protect against human disturbances, serve as habitat transition zones, and contribute to the protection of the natural feature through, for example, maintaining microclimate conditions and limiting the spread of invasive species to within the sensitive natural feature.

The outer limit of the ecological buffer area determines the constraint to development activities within the subject lands. For this development, NRSI provided recommendations on buffer requirements for a Site Alteration Plan for 3080 Bostwick Road – Block 7. This block is located on the western portion of the subject lands, west of the Thornicroft Drain. For the purposes of site alteration, NRSI identified buffers from the wetland and Significant Woodland to the south of the subject lands, as well as a buffer from the Thornicroft Drain. Recommended site alteration buffers are as follow:

- 15m from the wetland boundary
- 10m from the woodland dripline
- 15m from the Thornicroft Drain

The site alteration letter prepared by NRSI specifies that these buffers are for site alteration alone and are a temporary use (NRSI 2024). Final development buffers are determined through this EIS and have been specified below. These buffers have been based on buffer requirements as identified in the City of London EMGs (2025) and in consideration of existing conditions on site and adjacent development areas. In accordance with Section 5.4 of the EMGs, Low Impact Development (LID) measures associated with stormwater management will be proposed within the outer half of the mapped buffer area.

The ecological buffers as mapped from the boundary of natural heritage features have been shown on Map 4. As seen on Map 4, the surveyed natural feature boundaries result in a jagged buffer line, which would result in a cumbersome development boundary. In order to provide a more manageable development envelope and more ecologically stable buffer area, a smoothed development limit from the natural feature boundaries was identified by NRSI and York Developments. The smoothed development limit is shown on Map 5, along with area

calculations to demonstrate that the proposed smoothed development limit will result in an overall increase to the buffer area.

6.1 Significant Woodland Buffer

In accordance with the City of London EMGs, a 20m buffer is identified for Significant Woodlands that are greater than 2ha in size (2025). The Significant Woodland associated with the subject lands is well over 2ha in size. As such a 20m buffer has been recommended for the majority of this feature adjacent to the subject lands. The 20m buffer has been identified from the Significant Woodland for the portion of the feature to the west of the Thornicroft Drain. The buffer has been mapped from the Significant Woodland dripline. As described above, the buffer has been smoothed. Through this smoothing a variable buffer between 18m and 27m has been provided from the Significant Woodland boundary.

A reduced buffer that is 10m wide has been recommended along the east side of the Significant Woodland, within the subject lands. A 10m buffer is recommended for consistency with the 10m buffer recommended for the Kilbourne Lands to the immediate south. Additionally, this portion of the Significant Woodland is the most disturbed, primarily comprising a Cultural Woodland with sparse Black Walnuts and containing meadow vegetation. Based on these characteristics, this portion of the Significant Woodland is not expected to be as sensitive as the areas that consist of forest communities. A 10m buffer along the west side of the natural feature will provide sufficient protection for the root zones of trees within the feature and protect from edge effects. A chain link fence is recommended along this portion of the buffer to prevent pedestrian movement into the feature. As a result of buffer smoothing, the buffer varies between 7m and 18m from the Significant Woodland boundary.

6.2 Wetland Buffer

In accordance with the City of London EMGs, a 30m buffer is identified for all wetlands within the City (2025). To satisfy this requirement, a 30m buffer has been identified from the northern boundary of the SWD2-2 wetland associated with the Significant Woodland. Where the wetland buffer and the Significant Woodland buffer overlap, the greater of the two constraints has been applied. The overall development limit has been identified through smoothing of the buffer, as a result of this the wetland buffer varies between 26m and 31m from the wetland boundary.

7.0 Impact Analysis

Details of the proposed development for 3080 Bostwick Road – Block 7, 8 and 9 are provided in the following supporting documents: Schematic Design, 3080 Bostwick Road, London Ontario. Site 7 (Zedd Architecture 2025), Kilbourne Subdivision Lands – Draft Plan of Subdivision (MHBC 2025) and the Bostwick Master Plan (Zedd Architecture 2022). Refer to Map 5 for the proposed development concept plan and block plan.

7.1 Proposed Undertaking

The proposed development will consist of three development blocks, 7, 8 and 9, an internal road network and stormwater management controls (MHBC 2025, Zedd Architecture 2025). Block 7 is proposed to contain two apartment buildings, Building 1 and Building 2, see Appendix XI. Building 1 is proposed to contain 356 apartment units, while Building 2 will contain 405 apartment units. Ground level and underground parking will be provided for apartment residents within the developed portion of Block 7. Stormwater management on-site will be provided through an on-site stormwater management facility, located to east of Building 2. Additional LID stormwater management for rooftop runoff will be provided through the use of an infiltration gallery to promote infiltration in the outer third of the proposed buffer area.

Block plan level concepts have been developed for Blocks 8 and 9, see Appendix XII. Block 8 is proposed to function as medium density residential, while Block 9 will be a medium density apartment building (MHBC 2025). Stormwater management within Blocks 8 and 9 will be provided through a stormwater pond associated with the Kilbourne Lands development located to the immediate south of Block 8 and 9 (Stantec 2025, NRSI 2026).

7.2 Approach to Impact Analysis

The potential impacts associated with 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 type of impacts that 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 subject lands.

- **Direct** impacts are discussed in relation to the natural features and wildlife on the subject lands associated with disruption or displacement caused by any potential future 'footprint' of the undertaking.
- **Indirect** impacts are discussed in relation to changes in site conditions such as drainage and water quantity/quality on the subject lands and adjacent communities, as well as impacts that may occur following construction of the development.

7.2.1 Evaluation of the Potential Effects, Mitigation and Net Effects

Impacts, mitigation measures, other recommendations, and net effects are detailed in Table 8. The table details the impact of all components of the proposed development.

Table 8. Impact Assessment, Mitigation and Net Effects

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 Existing Conditions	The existing land within the subject lands and along the Thornicroft Drain is primarily agricultural. As a result, the natural features located within and adjacent to the subject lands are subject to agricultural edge effects including plowing and tilling within the root zones of trees and agricultural runoff.	Ecological buffers have been identified for all natural heritage features within and adjacent to the subject lands. These buffers include a 30m buffer from the wetland to the south of the subject lands, a 20m Significant Woodland buffer for the portion of Significant Woodland to the west of the Thornicroft Drain, and a 10m buffer from the portion of Significant Woodland to the east of the Thornicroft Drain. Significant Valleyland has been mapped at an extent of 30m of either side of the top of slope associated with the Thornicroft Drain. This will result in a >60m wide complete corridor within the subject lands. Buffer areas and the Significant Valleyland will be seeded and planted with native vegetation to protect from edge effects and create wildlife habitat.	<u>(+) Net Positive Effect</u> The removal of existing agricultural land uses adjacent to natural heritage features and the Thornicroft Drain, and the establishment of a >60m wide natural corridor will improve the ecological form and function of the watercourse and adjacent natural features. Wide use of pesticides and fertilizer application from the agricultural fields will be eliminated. Through the development of a comprehensive buffer enhancement plan, the proposed development is not expected to result in a negative impact to natural features within the subject lands or their ecological function. Overall, a net positive effect will be observed for adjacent natural heritage features and the Thornicroft Drain by protecting and establishing a vegetated corridor of a substantial width.

SOURCE OF IMPACT	POTENTIAL AREAS AFFECTED & POTENTIAL EFFECTS	AVOIDANCE, MITIGATION, COMPENSATION	NET EFFECTS & RATIONALE
2.0 Direct Impacts:			
2.1 Protected Species and Protected Species Habitat	Candidate habitat for Protected Species bats has been identified within treed communities on and adjacent the subject lands. Grading and construction activities adjacent to this candidate habitat have the potential to negatively impact these species.	Vegetation removal is not expected to be required for the development of the subject lands, as a result candidate habitat for these SAR will not be directly impacted. Buffers have been established adjacent to the Significant Woodland feature that provides candidate Protected Species habitat. These buffer areas are proposed to be enhanced through seeding and plantings.	<u>Net Positive Effect</u> At this stage, no impacts to Protected Species habitat or contravention of the Species Conservation Act is anticipated as long as the recommended mitigation measures and assessments are implemented. Plantings and establishment of buffers from natural heritage features will result in a net increase to wildlife habitat on the subject lands
2.6 Site Grading *Grading limits have not been determined yet; however, the site alteration limit and overall buffer limit have been identified.	Site grading has the potential to cut or compress tree root systems, change hydrological flow patterns, destabilize slopes, and remove wildlife habitat.	Grading will be limited to areas located outside of the site alteration buffer limit, as identified in the memo prepared by NRSI (2024). Following the completion of site alteration activities the development buffer limit will be applied, as identified in this report. The extent of grading activities has been designed to avoid natural heritage features. Limits of development have been clearly demarcated to prevent encroachment into the surrounding natural features. These boundaries have been delimited using Erosion and Sediment Control (ESC) fencing. These measures are to be implemented to ensure any activities associated with the development are restricted outside of natural areas and their buffers.	<u>No Net Effect</u> Impacts related to grading are expected to be minimized and low in impact due to the mitigation measures proposed. ESC measures will be provided in all areas where grading, servicing and construction is proposed.

SOURCE OF IMPACT	POTENTIAL AREAS AFFECTED & POTENTIAL EFFECTS	AVOIDANCE, MITIGATION, COMPENSATION	NET EFFECTS & RATIONALE
		Clean equipment protocol to be followed. A detailed ESC Plan as per the City of London Design Standards Requirements (2019) should be prepared and implemented.	
2.7 Buffer Encroachment	Minor encroachment into buffers delineated from the boundary of natural features is proposed for smoothing of the buffers. A surface swale promoting infiltration of roof runoff is proposed within the outer half of the identified buffer area to the south of Block 7.	The identified buffer encroachments are all minor in scale. Encroachment into buffer areas amounts to approximately 180.37m², while exceedance of buffer areas as a result of buffer smoothing results in an area of approximately 371.98m². The proposed approach of buffer smoothing will result in a net gain of 191.61m² in total buffer area. In order to prevent edge effects and additional encroachment into buffer areas during construction, the limit of development should be demarcated in the field. No equipment or construction materials are to be stored within buffers.	<u>(+) Net Positive Effect</u> Buffer encroachments are limited within the subject lands, particularly when compared to the area of buffer exceedance. Through the revegetation of established buffer areas and delineation of the limit of development in the field, no negative impacts are anticipated. The quantity of buffer exceedance will result in a net positive effect once planted within native vegetation. LID SWM measures are proposed in the outer half of the buffer area to the south of Block 7. Use of LID SWM measures in buffers is permitted in accordance with the City of London EMG (2025). The proposed measures will aid in maintaining water balance within wetlands to the south of the subject lands and ultimately the Thornicroft Drain.

SOURCE OF IMPACT	POTENTIAL AREAS AFFECTED & POTENTIAL EFFECTS	AVOIDANCE, MITIGATION, COMPENSATION	NET EFFECTS & RATIONALE
2.8 Damage to Vegetation	Damage to trees and vegetation adjacent to the proposed development area can occur during construction activities. This can result in scarring and damage to vegetation by machinery, the decreased health of vegetation from dust and sedimentation, and the introduction of non-native species.	Implementation of the buffers identified on Map 5 and delineation of their boundaries with ESC fencing or other visual markers will prevent encroachment into these areas and limit the potential for unintended vegetation damage. Development and implementation of ESC plan. The City of London's Clean Equipment Protocol should be followed to minimize the spread of invasive species.	<u>No Net Effects</u> Through the implementation of the recommended mitigation measures, damage to vegetation will be limited to the greatest extent possible. No net effects are anticipated.
2.9 Machinery Maintenance	Maintenance and refueling of construction machinery and equipment can result in the potential contamination of soils, vegetation and water.	All machinery maintenance should be completed in designated areas away from natural features and buffers, and at a high elevation point on-site where possible. Best Management Practices are to be implemented during construction, these include: • Development of a spill action response plan; and • Development of a 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.	<u>No Net Effect</u> All potential impacts relating to machinery and equipment maintenance can be mitigated through the implementation of the detailed measures and Best Management Practices.

SOURCE OF IMPACT	POTENTIAL AREAS AFFECTED & POTENTIAL EFFECTS	AVOIDANCE, MITIGATION, COMPENSATION	NET EFFECTS & RATIONALE
3.0 Indirect Impacts:			
3.1 Hydrological Changes – SWM and Water Balance Kilbourne Subdivision Functional Stormwater Management Report (Stantec 2025). Hydrogeological Report – Kilbourne Lands (EXP 2024)	Changes to stormwater drainage on the subject lands can result in impacts to wetland features, the Thornicroft Drain, as well as off-site wetlands, watercourses and other natural features. The impacts have the potential to result in increased surface water runoff, decreases to water quality, and changes to water balance. Construction activities can result in contamination of surface water features. These impacts are short term and can be minimized through the implementation of mitigation measures.	On-site SWM quantity controls are proposed for implementation. The subject lands have been divided into two catchment areas. Stormwater from Block 7 will be directed to an on-site infiltration gallery located to the immediate east of Building 2. Clean roof-top runoff will be directed to a surface swale installed in the outer third of the ecological buffer located to the immediate south of Block 7. Storm water infiltrated through the gallery and surface swale will enter the wetland located to the south of the subject lands and ultimately outlet into the Thornicroft Drain. This approach will aid in maintaining water balance to the wetland adjacent to the subject lands. A detailed water balance assessment has not yet been completed for Block 7. A detailed SWM strategy for Block 7 should be developed at the focused design stage to ensure that no net negative impacts occur. The FSWMR prepared by Stantec (2025) identifies that storm water associated with Blocks 8 and 9 will be directed to the SWM pond associated with Block 85 of the Kilbourne Lands Subdivision (MHBC 2025). Adequate area is available within the SWM block to attenuate flows for the 2-year to 100-year design storms. LID measures have been proposed for the development area	<u>To be determined. The goal: No Net Effect</u> No net effects are anticipated as a result of the approach to SWM within Block 7; however, additional information is required for the completion of a detailed impact analysis. A detailed SWM strategy should be developed with details on measures to prevent increases to surface runoff, decreases to water quality and changes to water balance. Based on the FSWMR, proposed SWM strategy (Stantec 2025) and Hydrogeological Assessment (EXP 2024), no long-term negative effects are anticipated as they relate to water quantity and quality impacts. The proposed Block 85 SWM dry pond will provide sufficient space to attenuate stormwater flows to pre-development rates. Quality controls will be implemented to ensure water quality meets the required 80% TSS removal. Infiltration measures have been proposed on-site to promote infiltration of water wherever possible.

SOURCE OF IMPACT	POTENTIAL AREAS AFFECTED & POTENTIAL EFFECTS	AVOIDANCE, MITIGATION, COMPENSATION	NET EFFECTS & RATIONALE
		and include shallow turfed depressions in boulevards to infiltrate stormwater, stormwater exfiltration systems, and oil/grit separators upstream of the SWM facilities. These proposed measures will infiltrate water on-site and act as water quality controls to ensure that the target of 80% TSS removal is achieved. The FSWMR (Stantec 2025) also notes that the inclusion of the additional infiltration measures in the SWM strategy will be explored at the detailed design stage. Further analysis should be completed as part of the hydrogeological assessment to confirm that the calculated post-construction water balances are accurate. This should include an analysis and quantification of surface runoff contributions from the Kilbourne Subdivision Lands development to the wetlands associated with the wetlands located in the woodland to the south of the subject lands. Regardless of the conclusion of the additional water balance analysis, it is recommended that the infiltration measures suggested in the FSWMR be implemented in the detailed SWM design for the subject lands to ensure post-construction water balance matches pre-construction levels. Additional measures such as the collection of rooftop runoff or contribution of flows through spreader swales from the dry SWM ponds to wetlands on the subject lands should be considered to ensure post-development water balance	A final SWM plan should be developed at the detailed design stage and impacts re-evaluated to ensure no net negative effect is anticipated. Water balance calculations and mitigation measures are to be updated and addressed through focused design studies as a Draft Plan condition. Post-construction water balance for the wetlands on site should be within (+/-) 10% of the pre-development conditions. This should be achievable through the use of LID measures and by enhancing surface water contributions to Catchment A.

SOURCE OF IMPACT	POTENTIAL AREAS AFFECTED & POTENTIAL EFFECTS	AVOIDANCE, MITIGATION, COMPENSATION	NET EFFECTS & RATIONALE
		is consistent with pre-development conditions. Construction-stage measures should be implemented to ensure that sediment, spills, debris, and other deleterious substances are prevented from migrating off-site into the adjacent watercourse and wetland features. These measures should be incorporated into an ESC Plan for the development once it has been prepared.	
3.3 Impacts / Disturbance to Adjacent Natural Features and Wildlife Habitats	Indirect disturbances can cause stress 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. Additionally, these disturbances may disrupt or discourage breeding birds from nesting within the vicinity.	Limits of development will be clearly demarcated to prevent encroachment into the surrounding natural features as per the site alteration letter prepared by NRSI (2024). Large buffer areas have been included from natural heritage features to protect them and wildlife inhabiting them from disturbance. To avoid and minimize potential for invasive, non-native species, clean equipment protocol to be followed, restoration of the buffer and management of existing non-native species to be implemented. In order to suppress dust, areas of bare soil should be moistened with water during construction activities to ensure that the amount of dust within the subject lands is reduced. Topsoil stockpile locations should be in areas of lesser wind exposure and away from natural features and their buffers.	<u>No Net Effect</u> Through the implementation of the proposed mitigation measures impacts resulting from construction related dust, noise, and vibrations are expected to be temporary, minimal, and localized during the construction of the proposed development. Significant effects on wildlife are not anticipated, and it is expected that displaced wildlife species adjacent to the site will return to the vicinity of the subject lands following construction. Directional lighting, construction schedules, soaking exposed soils should effectively ensure that there are no significant net impacts.

SOURCE OF IMPACT	POTENTIAL AREAS AFFECTED & POTENTIAL EFFECTS	AVOIDANCE, MITIGATION, COMPENSATION	NET EFFECTS & RATIONALE
		Impacts resulting from increased noise and vibration can be mitigated by restricting the daily timing of construction activities to between 7:00am and 7:00pm. All lighting equipment associated with construction should be turned off during non-operational hours or at the very least should be directed away from adjacent natural features to prevent “lightwash” of these areas. Lighting of houses, yards, and streets should also be directed away from natural heritage features. Chain link fencing should be provided along the development limit following construction where the development borders natural heritage features.	
3.4 Erosion and Sedimentation *During construction phase	During construction, areas of bare soil may be exposed that have the potential to erode during precipitation events and impact adjacent natural features. In the event of a heavy rain or snow melt event, sediment laden runoff can enter adjacent natural areas by way of overland flow.	ESC fencing will be required as part of a detailed ESC Plan. A preliminary ESC Plan was developed by Stantec and reviewed as part of the site alteration letter prepared by NRSI (2024). Disturbed areas should be kept to a minimum and re-vegetated in a reasonable timeframe in order to minimize dust and erosion. Inspection and maintenance of the installed ESC measures throughout the duration of construction, to ensure they are functioning as originally intended.	<u>Not Net Effect</u> Through the design and implementation of a proper ESC plan, no significant net impacts are expected due to erosion and sedimentation.
3.5 Use of natural areas as a result of the development	Natural features and proposed buffers that are located adjacent to the development area can be impacted	Permanent fencing with no gates should be installed along the development limit	<u>Not Net Effect</u>

SOURCE OF IMPACT	POTENTIAL AREAS AFFECTED & POTENTIAL EFFECTS	AVOIDANCE, MITIGATION, COMPENSATION	NET EFFECTS & RATIONALE
	through increased use of a natural area by residents or users of the property, feral and domestic wildlife, and unauthorized trail/pathway construction.	where lots back onto natural heritage features and buffer areas. An educational brochure should be considered for circulation to residents to inform them of the significance of the natural features and species in the area and what they can do to reduce the potential for impacts (e.g., dumping of yard waste, encroachments, pet waste, pets roaming free, etc.). The increase in noise, human presence and artificial lighting resulting from the proposed residential development can disrupt or deter wildlife from inhabiting the treed features on site. It is recommended that low intensity, downward-projected lighting be installed for street light standards to reduce the effects of lightwash.	Through the correct use of these mitigation measures, it is anticipated that the effects of the induced impacts will be small in magnitude. These impacts have the potential to be permanent, although they can be reduced at any point through education and enforcement.

8.0 Environmental Management Recommendations

8.1 Planning and Design Stage

1. A detailed grading plan for the proposed development will be developed at the focused design stage.
2. A TIPP should be prepared to address any proposed tree removals from the subject lands and to determine compensation requirements. The TIPP will also identify the location of Tree Protection Fencing, if required.
3. A detailed SWM Plan is to be developed at the focused design stage. This plan should identify specific stormwater quantity and quality controls and promote infiltration on-site. An updated water balance calculation should be provided as part of this plan to ensure that no negative changes to water balance will occur as a result of the proposed development.
4. A Buffer Enhancement and Restoration Plan will be developed at the detailed design stage, as part of the Complete Corridor Plan. This plan will include a planting plan for the buffer areas and buffer exceedance areas within the subject lands and will include native species that have been found within the Thornicroft Drain Corridor.
5. An Environmental Monitoring Plan (EMP) should be developed to identify monitoring requirements during and post-construction. The EMP should be developed in conjunction with the first submission of engineering drawings and will identify a 5-year detailed monitoring program for natural heritages features and functions. It is recommended that the EMP for the 3080 Bostwick – Block 7, 8 and 9 development and the Kilbourne Subdivision Lands development be prepared under the same cover to ensure a cohesive approach to environmental management and monitoring at all stages of the development. The requirements are anticipated to include monitoring of mitigation measures installed within the subject lands during construction. Post-construction monitoring is expected to include monitoring of plantings within the buffer and buffer exceedance areas as well as the constructed wetland (on the Kilbourne Subdivision Lands), to the satisfaction of the City. An annual monitoring report shall be provided each year of the program to the City's Ecologist.
6. A detailed ESC plan should be developed by a qualified engineer for implementation during construction. This plan should include all proposed ESC measures, including but not limited to ESC fencing, straw bales and check dams.

7. The Thornicroft Drain corridor shall be conveyed to the City of London and remediation works in the Thornicroft Drain corridor will be undertaken by the City, and not as an obligation to this Draft Plan.

8.2 Construction Stage

8. ESC fencing is to be installed along the entirety of the development limit, as identified in the site alteration letter, to prevent erosion and sedimentation and to demarcate the development area in the field.
9. Once site alteration within the post-development buffer area is complete, ESC fencing is to be installed along the development limit as identified in this report and the ESC fence within the buffer area is to be removed.
10. ESC measures on the subject lands will require certification by the Contract Administrator and the construction monitoring program will be maintained during site development, until 70% buildout. This will not be restricted to the establishment of ESC controls, but to on-going maintenance such as active lot drainage control, street sweeping, stockpile seeding, etc.
11. Stabilization and re-vegetation of bare soil areas after grading should be completed as soon as possible.
12. Tree and vegetation removals should be restricted to outside the peak breeding season window for migratory birds (April 1- August 31) and the active season for bats (April 1 – November 30).
13. A spill action response plan and spill contingency plan should be developed prior to the initiation of construction activities.
14. The City of London's Clean Equipment Protocol should be followed to minimize the spread of invasive species.
15. In order to suppress dust, areas of bare soil should be moistened with water during construction activities to ensure that the amount of dust within the subject lands is reduced.
16. Topsoil stockpile locations should be in areas of lesser wind exposure and away from natural features and their buffers.
17. Construction activities should be restricted to 7:00am to 7:00pm, with artificial lighting turned away from natural features.
18. The design of directional lighting fixtures should be compliant with IDA Dark Sky standards.

8.3 Post-Construction Stage

19. Stabilization and re-vegetation of bare soil areas after construction is complete should be completed as soon as possible. Vegetation should not be used as a stabilization method in the summer and winter months; other stabilization methods should be used until planting conditions are appropriate.
20. ESC fencing should be removed upon completion of construction activities.
21. Promote environmental stewardship awareness through provision of an environmental guide/brochure that contains a list of recommendations (i.e. dos and don'ts) to avoid/minimize residual impacts (i.e. control pets, avoid tree removals, avoid use of pesticides and toxic materials, use of invasive plant species/native species alternatives).
22. A 2-year monitoring plan, as described in the proposed EMP, should be implemented to observe survival of planted trees and vegetation within the buffer areas of the subject lands.
23. A comprehensive 5-year monitoring plan, as described in the EMP, should be implemented to ensure that the proposed residential development has no negative impacts on surrounding natural features and buffer areas post-construction and post-development.

9.0 Summary

NRSI was retained in April 2019 by Kilbourne Developments and Westgate Developments (London) Inc., care of York Developments to complete an EIS for a proposed development in the southwest of London. This EIS has been prepared to address the proposed development of Blocks 7, 8 and 9 on the 3080 Bostwick Roads and has been prepared in accordance with the updated City of London's Environmental Management Guidelines (2025). EIS report has been prepared by NRSI for the Kilbourne Subdivision Lands which are located to the immediate south of the subject lands addressed in this report. The Kilbourne Subdivision Lands EIS has been submitted under a separate cover and should be reviewed in conjunction with this EIS (NRSI 2026).

The subject lands are approximately 4ha in area and are located southeast of the intersection of Bostwick Road and Southdale Road West. The subject lands border Bostwick Road to the west, and consists of annual row crop fields, a woodland in the south, and the Thornicroft Drain and associated riparian habitat that borders the property in a north-south direction to the east. The subject lands are located within Ecoregion 7E.

Based on the results of background reviews and field surveys, this EIS found that several significant and sensitive natural features are present within and adjacent to the subject lands. The large woodland located to the southwest of the subject lands, as well as woodlands along the Thornicroft Drain have been identified as significant in accordance with the London Plan. The woodland to the south of the subject lands contains two non-significant wetlands. Significant Valleyland is present along the Thornicroft Drain. The Thornicroft Drain provides direct fish habitat and is an important movement corridor for wildlife across the local landscape. Several HDFs requiring Conservation are present within the woodland to the south of the subject lands.

The large woodland associated with the subject lands has been considered to provide candidate habitat for Protected Species bats. SWH has been confirmed for a rare vegetation community (FOD7-4), Terrestrial Crayfish, Western Chorus Frog, and Eastern Wood-Pewee within this woodland. Candidate SWH has also been identified for Bat Maternity Colonies. Additionally, regionally significant vascular plants species have been identified from the adjacent woodland.

Buffers have been identified for significant and sensitive natural features within and adjacent to the subject lands. A minimum corridor width of 60m has also been established for the

Thornicroft corridor. A smoothed buffer has been proposed from natural features, including Significant Woodland and wetland, located to the south and east of Block 7, and to the west of Block 8 and 9. The smoothed buffer approach will result in a net gain to overall buffer areas, when compared to the strict application of natural feature buffers as described in the City of London EMG (2007, 2025).

A Net Effects Assessment was completed for the proposed development which considered the source of the impacts, potential areas affected, and potential effects. Avoidance, mitigation, and compensation measures were identified and the overall net effects and rationale provided. As demonstrated in the Net Effects Assessment table, assuming the recommended avoidance, mitigation and compensation measures are implemented properly, no negative impacts on the natural features or on their ecological functions should occur. In addition, a significant net positive effect will be provided for the Thornicroft Drain corridor through the widening of the corridor to a width $\geq 60\text{m}$ along the length of the watercourses that flows through the subject lands. Through the addition of planted buffer areas and when considered in conjunction with the development of lands to the south, these improvements will result in a more robust and higher quality corridor.

At this stage of the proposed project, the intent and all requirements of the environmental policies of the City of London Plan, PPS, and other relevant legislation have been met (see Table 1). Recommendations are provided within this report for the focused design stage of the development to ensure that all relevant policies and regulations continue to be met as recommended.

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Maps

Appendix I
Protected Species and Species of Conservation Concern Screening

Appendix II
Significant Wildlife Habitat Screening

Appendix III
Vascular Plant Species Reported from the Study Area

Appendix IV
Bird Species Report from the Study Area

Appendix V
Herpetofauna Species Reported from the Study Area

Appendix VI
Mammal Species Reported from the Study Area

Appendix VII
Lepidoptera Species Reported from the Study Area

Appendix VIII
Odonata Species Reported from the Study Area

Appendix IX
Fish Species Reported from the Study Area

Appendix X
Management Guidelines for Headwater Drainage Features

Appendix XI
Schematic Design, 3080 Bostwick Road, London Ontario - Site 7

Appendix XII
Proposed Draft Plan of Subdivision – Kilbourne and Westgate Lands
