Environmental Impact Study

Smithville Block Plan Area 9, West Lincoln

Update: Second Submission

Prepared for

Lockbridge Developments

25 Sable Street
North York
Toronto, ON
M6M 3K8

October 14, 2025
Project No. P2024-922

Prepared by

GeoProcess Research Associates Inc.
133 King Street West
PO Box 65506 DUNDAS
Dundas, ON L9H 6Y6

Version History

Version	Date	Issue	Description	Author	Approved
V1	2024-11-21	Final	First Submission	LB	KG
V2	2025-10-14	Final	Second Submission	BT	KG

Table of Contents

List of Figures

List of Tables

List of Maps

1. Introduction

GeoProcess Research Associates Inc. (GeoProcess) has been retained by Lockbridge Developments to complete an Environmental Impact Study (EIS) for a proposed residential development occupying approximately 13.5 hectares (ha) of land in the rural community of Smithville within the Township of West Lincoln, Ontario (Map 1). This is herein referred to as the "Subject Property". The Subject Property, in addition to surrounding lands within 120 metres (m), will be considered the "Study Area".

The Subject Property is situated south of Townline Road between Port Davidson Road and Shurie Road and is located within the Urban Boundary Expansion Area for the Community of Smithville. Block Plan Area 9 was successfully brought into the Smithville Urban Boundary under Official Plan Amendment (OPA) 63. A Subwatershed Study (SWS) and Master Community Plan (MCP) Study were previously prepared for the Study Area to plan for future growth. The Subject Property is included within the larger 63.5 ha Block Plan Area 9. Under Schedule C2 Natural Environment System (NES) of the Niagara Official Plan (NOP), the Subject Property contains a small area designated as "Other Wetlands and Non-Provincially Significant Wetlands" in the northwest portion of the property where a tributary of Twenty Mile Creek flows. As per OPA 63, Schedule E-10 and Schedule E-12, one NES was identified on the Subject Property, a Linkage, along with Significant Woodlands to the north and south beyond the Study Area boundary. The Linkage located within the Subject Property was classified as a Secondary Linkage, connecting North Creek and Twenty Mile Creek corridors to the south and north of the Subject Property, respectively.

The requirement for an EIS was triggered during the Pre-Consultation Meeting held on February 1, 2024, to be included in applications for the Draft Plan and Subdivision and Zoning By-law Amendment for the proposed Block Plan. This EIS builds upon work previously completed for the Subwatershed Study (SWS). It establishes the extent and function of the natural heritage features within the Study Area, considering the natural environment within the context of the policies of the Township of West Lincoln (the Township), Niagara Region, Niagara Peninsula Conservation Authority (NPCA), and the Province of Ontario. In completing this EIS, the potential impacts of the proposed development on key natural heritage features were assessed, and mitigation measures to protect and enhance the function and connectivity of these features are provided.

This EIS submission has been revised to address comments provided by the Township, Niagara Region, and NPCA. It has been updated to include all additional ecological studies conducted by GeoProcess and Stantec in 2025, as well as a summary and evaluation of studies completed for the Phase 1 Smithville Subwatershed Study and Stormwater Management Plan (Wood 2023), as they pertain to the Subject Property. It has been prepared according to the Phase 1 Draft Plan developed for Block Plan Area 9.

1.1. Study Area

The Study Area is situated approximately 0.9 kilometres (km) west of Highway 20 (St Catharines Street) and 0.5 km east of Port Davidson Road in Smithville, Ontario. It is bound by Townline Road to the north and the North Creek corridor to the south. The Subject Property is primarily comprised of agricultural lands and supports a limited number of natural heritage features. A small, wooded feature is present at the northeast corner of the lands, as well as a small headwater tributary of Twenty Mile Creek (Reach TM3(1)3). Other

features include multiple headwater drainage features and agricultural hedgerows. A decommissioned railway line borders the eastern boundary of the Subject Property. Surrounding land use is largely agricultural, with the Community of Smithville situated to the north of the Subject Property. A residential subdivision is located adjacent to the lands to the east.

As previously noted, the Study Area has been included within the Urban Boundary Expansion, completed in 2023. The lands have been designated as residential and include a Proposed Linkage along the east side of the Subject Property where the former railway was located (Map 2). The linkage is intended to connect natural heritage features to the north and south. As per the Phase 2 SWS (Wood 2023), a portion of a Recommended Restoration Area is also present at the southeast quadrant of the Subject Property, extending from the Significant Woodland to the south.

2. Policy Context

Land use is regulated by various agencies given authority through acts, legislation, and regulations. These intergovernmental agencies establish and implement policy frameworks to govern their respective jurisdictions as they relate to natural heritage, water, fisheries, urban/rural development, municipal infrastructure, and other environmental features. The policies in this section will cover the relevant statutes, regulations, policies, and plans regulating development within the Study Area to provide an understanding of regulated features, prohibited activities, and development opportunities.

2.1. Provincial Planning Statement (2024)

The Provincial Planning Statement (PPS) is administered under Section 3 of the *Planning Act*. It became effective October 20, 2024, and replaces the Provincial Policy Statement that came into effect May 1, 2020. The PPS applies to planning decisions made on or after that date. It provides policy direction for land use and development within the Province of Ontario and provides for appropriate development while protecting resources of provincial interest, public health and safety, and the quality of the natural and built environment. The policies of the PPS may be complemented by provincial and municipal plans and policies.

The PPS defines eight natural heritage features and provides planning policies for each, listed below. The function of Natural Heritage Features and Areas is further clarified by the definition of a Natural Heritage System, which is *"a system made up of natural heritage features and areas, and linkages intended to provide connectivity (at the regional or site level) and support natural processes which are necessary to maintain biological and geological diversity, natural functions, viable populations of indigenous species, and ecosystems."*.

I. Significant wetlands
II. Coastal wetlands
III. Fish habitat
IV. Significant woodlands
V. Significant valleylands
VI. Habitat of endangered species and threatened species
VII. Significant Wildlife Habitat
VIII. Significant Areas of Natural and Scientific Interest (ANSIs)

Sections 4.0 and 5.0 of the PPS deal with development and site alteration, and where these activities shall not be permitted. Section 4.0 policies surround the conservation of biodiversity, and protection of the health of the Great Lakes, natural heritage, water, agricultural, mineral and cultural heritage and archaeological resources for their economic, environmental, and social benefits. Section 5.0 directs development away from areas of natural or human-made hazards to mitigate risks to public health or safety, and property damage from natural hazards, including the risks that may be associated with the impacts of a changing climate.

Policies in Section 4.1 are particularly relevant as they surround development and site alteration in and adjacent to natural heritage features. These policies and select others are outlined below, in Table 1.

Table 1. Applicable Policies of the Provincial Planning Statement

Policy Number	Policy
(4.1 - Natural Heritage) 4.1.2	The diversity and connectivity of natural features in an area and the long-term *ecological functi*on and biodiversity of *natural heritage systems* should be maintained, restored or where possible, improved, recognizing linkages between and among *natural heritage features and areas*, *surface water features* and *ground water features*.
4.1.3	*Natural heritage systems* shall be identified in Ecoregions 6E & 7E, recognizing that *natural heritage systems* will vary in size and form in *settlement areas, rural areas*, and *prime agricultural areas*.
4.1.4	*Development* and site alteration shall not be permitted in: a) *significant wetlands* in Ecoregions 5E, 6E and 7E; and, b) *significant coastal wetlands*.
4.1.5	Development and site alteration shall not be permitted in: a) *significant wetlands* in the Canadian Shield north of Ecoregions 5E, 6E and 7E; b) *significant woodlan*ds in Ecoregions 6E and 7E (excluding islands in Lake Huron and St. Marys River); c) *significant valleylands* in Ecoregions 6E and 7E (excluding islands in Lake Huron and St. Marys River); d) *significant wildlife habitat*; e) *significant areas of natural and scientific interest*; and f) *coastal wetlands* in Ecoregions 5E, 6E and 7E that are not subject to policy 4.1.4(b) unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.
4.1.6	*Development* and *site alteration* shall not be permitted in *fish habitat* except in accordance with *provincial and federal requirements*.
4.1.7	*Development and site alteration* shall not be permitted in *habitat of endangered species and threatened species*, except in accordance with *provincial and federal requirements*.
4.1.8	*Development* and *site alteration* shall not be permitted on *adjacent lands* to the *natural heritage features and areas* identified in policies 4.1.4, 4.1.5 and 4.1.6 unless the *ecological function* of the *adjacent lands* has been evaluated and it has been demonstrated that there will be no *negative impacts* on the natural features or on their *ecological functions*.
(4.2 - Water) 4.2.2	*Development* and *site alteration* shall be restricted in or near *sensitive surface water features* and *sensitive ground water features* such that these features and their related *hydrologic functions* will be protected, improved or restored, which may require mitigative measures and/or alternative development approaches.
(5.2 - Natural Hazards) 5.2.1	Planning authorities shall, in collaboration with conservation authorities where they exist, identify *hazardous lands* and *hazardous sites* and manage development in these areas, in accordance with provincial guidance.
5.2.2	Development shall generally be directed to areas outside of: a) *hazardous lands* adjacent to the shorelines of the *Great Lakes - St. Lawrence River System* and *large inland lakes* which are impacted by *flooding hazards, erosion hazards* and/or *dynamic beach hazards*; b) *hazardous lands* adjacent to

Policy Number	Policy
	river, *stream* and *small inland lake systems* which are impacted by *flooding hazards* and/or *erosion hazards*; and c) *hazardous sites.*
5.2.4	Planning authorities shall prepare for the impacts of a changing climate that may increase the risk associated with natural hazards

2.2. Provincial Endangered Species Act (2007)

The Endangered Species Act (ESA) (2007) was amended on June 5, 2025, through the passing of Bill 5 and is to be replaced with the Species Conservation Act, 2025, at a later date. The purpose of the ESA (2007) is to provide protection and conservation to species at risk while considering social and economic factors for sustainable economic growth in Ontario. The protected species and their habitat are designated by the Committee on the Status of Species at Risk in Ontario (COSSARO) as endangered, threatened, extirpated, or of special concern, and the Government of Ontario adds species to the protection list based on COSSARO recommendations. These designations are defined as:

> Endangered: A species shall be classified as an endangered species if it lives in the wild in Ontario but is facing imminent extinction or extirpation.
>
> Threatened: A species shall be classified as a threatened species if it lives in the wild in Ontario, is not endangered, but is likely to become endangered if steps are not taken to address factors threatening to lead to its extinction or extirpation.
>
> Extirpated: A species shall be classified as an extirpated species if it lives somewhere in the world, lived at one time in the wild in Ontario, but no longer lives in the wild in Ontario.

Under the amended ESA, for the purposes of protection under the Act, habitat does not include places where the species formerly occurred or has the potential to be reintroduced unless existing members of the species depend on that area. The ESA defines habitat as the following:

> For animal species: habitat is a dwelling place that is occupied or habitually occupied for breeding, rearing, staging, wintering or hibernating, and the area immediately around a dwelling place.
>
> For vascular plant species: habitat is the surrounding critical root zone.
>
> For all other species: habitat is an area on which any member of a species directly depends in order to carry on its life processes

The ESA (Subsection 9(1)) outlines the prohibitions regarding harm to species and states that:

"No person shall,

(a) kill, harm, capture or take a living member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species;

(b) possess, transport, collect, buy, sell, lease, trade or offer to buy, sell, lease or trade,

(i) a living or dead member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species,

(ii) any part of a living or dead member of a species referred to in subclause (i),

(iii) anything derived from a living or dead member of a species referred to in subclause (i); or
(c) sell, lease, trade or offer to sell, lease or trade anything that the person represents to be a thing described in subclause (b) (i), (ii) or (iii).”

Clause 10 (1)(a) of the ESA also states that:

“No person shall damage or destroy the habitat of

- a species that is listed on the Species at Risk in Ontario list as an endangered or threatened species.
- a species that is listed on the Species at Risk in Ontario List as an extirpated species, if the species is prescribed by the regulations for the purpose of this clause. 2007, c. 6, s. 10 (1).”

Listed SAR previously identified by COSSARO, and now the Federal Government, are provided with general habitat protection under the ESA aimed at protecting areas that species depend on to carry out their life processes, such as reproduction, rearing, hibernation, migration, or feeding. In addition, specific habitat regulations for some species have been developed that specifically define the extent and character of their protected habitat beyond what is stated in the general habitat regulation. There are three applicable regulations under the ESA: Ontario Regulation 230/08 (Species at Risk in Ontario (SARO) List), Ontario Regulation 242/08 (General), and Ontario Regulation 830/21 (Exemptions – Barn Swallow, Bobolink, Eastern Meadowlark and Butternut). These regulations identify which species and habitats receive protection and provide direction on the current implementation under the ESA.

Activities prohibited by Subsection 9(1) and 10(1)(a) of the EIS that may impact a protected species, or its habitat, require the prior issuance of a permit from the Ministry of Environment, Conservation and Parks (MECP) unless the activities are exempted under Ontario Regulation 242/08. Ontario Regulation 242/08 (current as of April 1, 2024) identifies activities which are exempt from the permitting requirements of the Act; these activities are subject to rigorous controls outside the permit process, including registration of the activity and preparation of mitigation plans. Non-exempt activities require a complete permit application process.

2.3. Ontario Regulation 41/24 Prohibited Activities, Exemptions and Permits (2024)

Ontario Regulation 41/24 (effective April 1, 2024), issued under the *Conservation Authorities Act* (CA Act), replaced all 36 individual Conservation Authority regulations with a single, province-wide regulation. This regulation emphasizes public safety and removes the "pollution" and "conservation of land" tests for permitting. Conservation Authorities may grant permission for development if, in their opinion, the proposal will not affect flood control, erosion, dynamic beaches, or unstable soil/bedrock, and will not create conditions that could jeopardize health, safety, or property in the event of a natural hazard.

Section 28(1) of the CA Act prohibits the following activities within a Conservation Authority's jurisdiction:

(1) the alteration of watercourses or wetlands, and

(2) development within hazardous lands, wetlands, river/stream valleys, Great Lakes/inland lake shorelines subject to flooding/erosion/dynamic beach hazards, and other areas designated by regulation.

The Subject Property is within Niagara Peninsula Conservation Authority (NPCA) jurisdiction, and development activities in or adjacent to NPCA-regulated features are subject to regulatory approval.

2.3.1. Niagara Peninsula Conservation Authority

The NPCA is a natural resource management agency that protects, enhances, and sustains healthy watersheds within the Niagara Peninsula Watershed in the Province of Ontario. Under the *Conservation Authority Act, R.S.O. 1990*, c. 27 and Ontario Regulation 41/24 (Prohibited Activities, Exemptions and Permits), the NPCA regulates all watercourses, valleylands, wetlands, shorelines, and hazardous lands, as well as lands adjacent to these features. A permit is required before undertaking any development within a regulated area, and development must meet NPCA guidelines.

NPCA's *Policies for Planning and Development in the Watersheds of the Niagara Peninsula Conservation Authority* (2024) states the following polices which may apply to the Study Area:

- No development activity within the regulatory floodplain of Twenty Mile Creek and its tributaries, delineated by the 1:100-year flood using the one-zone concept.
- A 15-metre buffer shall be provided for watercourses containing intermittent flow.

The NPCA *Planning and Permitting Procedure Manual* (2022) outlines the planning and permitting application processes and guides for NPCA policy implementation to improve clarity and transparency around NPCA's administrative review procedures and technical submission requirements.

The Subject Property is within NPCA jurisdiction. A tributary of Twenty Mile Creek and associated headwater drainage features are natural features regulated under Ontario Regulation 41/24, which subjects any development on the property to regulatory approval from the NPCA.

2.4. Niagara Official Plan (2022)

As of March 31, 2025, the Niagara Region was identified as an upper-tier municipality without planning responsibilities. As such, the Niagara Official Plan is no longer a Regional Plan and is now an Official Plan administered by the Township of West Lincoln. Niagara Official Plan (NOP) schedules and policies that apply to the Study Area are detailed below.

The NOP identifies natural heritage and water resource systems for protection and defines policies to maintain, restore, and enhance biodiversity and connectivity of natural features, which exceed provincial requirements. Schedule L details the Natural Environment System (NES) components, definitions, and criteria.

Section 3.1, Objective k) states the need to *"identify linkages to protect ecological connectivity in the region".* Section 3.1.17 speaks to *"…opportunities for additional, ecologically appropriate linkages…"* not currently included in Schedule C2 to be screened for when an SWS is being completed in support of a Secondary Plan.

Section 3.1.17.3 states:

"When a subwatershed study is being undertaken, or when development or site alteration is proposed in, or within 30 metres of a linkage shown on Schedule C2, an evaluation shall be completed that:

a) *assesses the ecological features and functions of a linkage, including its vegetative, wildlife, and/or landscape features or functions;*
b) *identifies appropriate boundaries/widths that permit the movement of wildlife between nearby key natural heritage features, key hydrologic features, and/or natural heritage features and areas;*
c) *describes the ecological functions the linkage is intended to provide and identifies how these ecological functions can be maintained or enhanced within a development proposal;*
d) *assesses the potential for compatible uses including, but not limited to, stormwater management ponds, passive recreational uses, and trails within the linkage to determine how the intended ecological functions of the linkage can be maintained or enhanced;*
e) *assesses potential impacts on the linkage as a result of the development; and*
f) *makes recommendations on how to protect, enhance, or mitigate impacts on the linkage and its ecological functions through avoidance and planning, design, and construction practices."*

As per Section 3.1.20 Enhancements to the Natural Environment, the NOP supports enhancements to the NES, and where the preparation of an SWS or EIS is required, the study should demonstrate *"how enhancements to ecological function, ecological integrity, or biodiversity of the NES can be implemented and achieved."* Example i) pertains to Linkages where the objective is to *"establish or enhance linkages or connectivity between key Natural Heritage Features, and/or Natural Heritage Features and areas".*

Groundwater, surface water features and other hydrologic functions are included as required components of the NOP integrated NES; however, they are not identified or managed until more detailed watershed planning or equivalent is completed at a subsequent stage of the planning process. The MCP for Smithville, initiated by the Township of West Lincoln, required that an SWS be completed. Section 3.1.10.1 states that *"development or site alteration shall not be permitted unless it can demonstrate that it will not have negative impacts on:*

a) *the natural hydrologic characteristics of watercourses such as base flow, form and function and headwater drainage areas."*

Additionally, the NOP defines "Significant Surface Water Contribution Areas" as *"headwater drainage features classified as protection, conservation and mitigation"*. Classifying and recommending management for such areas must be done in accordance with the *Evaluation, Classification and Management of Headwater Drainage Features Guideline* (TRCA & CVC 2014).

As previously noted, under Schedule C2 NES, the Subject Property is also designated as an Urban Area Expansion and Urban Area. It contains a small pocket of space designated as "Other Wetlands and Non-Provincially Significant Wetlands" in the northwest portion of the property where a tributary of Twenty Mile Creek flows.

2.5. The Official Plan of the Township of West Lincoln (2022)

The purpose of the Official Plan of the Township of West Lincoln (2022) is to "*provide detailed development and land use policies for the Township of West Lincoln and to direct and guide development where it will best contribute to the long-term social, economic and environmental stability of the Township"*.

Objective l) under Section 3.6.3. of the Official Plan is *"to promote trails and corridors and linkages across the Township"*. The Subject Property contains a natural area along the former TH&B Railway that acts as a Linkage

between larger Natural Heritage Features within the NHS of Smithville. Section 10.3. states that *"the Township Council supports and encourages conservation and restoration of natural vegetation and wildlife throughout the rural and agricultural areas…"*. The Subject Property is an agricultural area (Schedule B-5) and, therefore, subject to encouraged restoration activities on any NH features present, i.e. the proposed Linkage area.

Policies speaking to Linkages and Restoration areas are as follows:

Policy 6.11.7.3.15 b)

b) No development or site alteration shall be permitted in, or within 30 metres of, a Linkage unless an Environmental Impact Study has demonstrated, to the satisfaction of the Township, Niagara Region, and any other approval authority, that there will be no negative impacts on the Linkage or its ecological and hydrologic functions. This requirement will be addressed through both the EIS required at the Block Plan stage and where a scoped EIS is required as part of a complete application for development.

6.11.7.3.16 a), b) and c)- Restoration Area

b) The proposed development of lands that contain all or part of a Recommended Restoration Area, or on lands that are within 30 metres of a Recommended Restoration Area, shall be subject to the requirement to undertake an Environmental Impact Study, to the satisfaction of the Township and any other appropriate agency or public body. This requirement will be addressed through both the EIS required at the Block Plan stage and where a scoped EIS is required as part of a complete application for development.

c) An EIS undertaken under Policy No. 6.11.7.3.16.b) with respect to a Recommended Restoration Area: i. shall delineate the boundaries of the Restoration Area to be incorporated into the proposed development;

ii. shall make recommendations regarding the specific types of restoration that are to be undertaken;

iii. may refine the boundaries of Recommended Restoration Areas as they are shown on Schedule "E-12", provided that the refined extent of "Recommended Restoration Area", or identified alternative restoration opportunities, contributes to the achievement of the natural cover target in combination with the other features and areas identified in Policy 6.11.7.3.3.e); and,

iv. may recommend the designation of an alternative Restoration Area, with priority given to those identified as Potential Restoration Areas on Schedule "E-12", provided that such an alternative Restoration Area will achieve the same, or very similar, ecological goals and outcomes as the original Recommended Restoration Area

Section 10.3.2. Policies state that *"development plans shall integrate natural features and natural vegetation, including the planting of native species. A landscape plan shall be provided for any commercial, industrial/employment, institutional or multiple-residential development."*. Natural landscaping and natural self-sustaining vegetation involve the practice of designing, cultivating and maintaining plant communities which are native to the area with minimal artificial interference (chemical fertilizers and pest control). Vegetation dominated by native species will grow and persist without direct human management, protection, or tending. Landscape plans should include such principles to contribute to ecological stability and resilience within the Smithville NHS.

Objective j) under Section 11.2 of the Official plan is to *"maintain, restore and improve the linkages among surface water features, groundwater features, hydrologic functions and natural heritage features and areas, and their ecological functions*".

The Official Plan outlines the importance of Linkages within the Core Natural Heritage System of Smithville in Section 10.7. stating the objective to *"recognize the linkages among natural heritage features and ground and surface water resources"*.

Schedule 'B-5' Urban Structure of Smithville classifies the Subject Property as an "Agricultural and Rural Area". As per OPA 63 Schedule E-10: Smithville MCP South Community Area Land Use Plan, and Schedule E-12: Smithville Natural Heritage System, the Subject Property designations have been changed to contain the following:

- Residential
- Medium Density
- Proposed SWM facility (Schedule E-10, Schedule E-12)
- Open Space
- Natural Heritage System (Schedule E-10, Schedule E-12)

2.5.1. Smithville Master Community Plan

The Township of West Lincoln initiated a Master Community Plan (MCP) to help guide the future growth and development of Smithville. The MCP provides a high-level community structure and the planning context for the future development of more detailed Secondary Plan(s) for smaller geographic areas, including future companion Master Environmental Servicing Plans (MESPs).

3. Methodology

The following provides the methodologies followed to complete the background studies and execute the field program designed to characterize the natural heritage features and their functions within the Study Area.

This EIS builds on work that has previously been completed for the Phase 1 SWS (Wood 2023) by Natural Resource Solutions Inc. (NRSI) and Matrix Solutions Inc. (Matrix). NRSI conducted natural heritage assessments, and Matrix conducted headwater drainage feature and watercourse assessments for the entirety of the Urban Boundary Expansion Area in Smithville in 2020. The information referenced in this report pertains solely to the fieldwork conducted within or applicable to the Subject Property. Methods employed by NRSI and Matrix are further detailed in the Phase 1 SWS Report (Wood 2023). It should be noted that an EIS was also completed by Myler Ecological Consulting in 2023 for the Subject Property. This report was reviewed as background material; however, results have not been included in this EIS as field methods and results were not provided.

GeoProcess completed desktop and scoped field investigations to supplement and confirm the work that was previously completed. GeoProcess staff conducted fieldwork between 2024 and 2025 to confirm the characterization of NHS presented in the SWS. Additional fieldwork was completed by Stantec, including a tree inventory.

3.1. Background Studies

Literature and data relevant to the Study Area were reviewed and evaluated to obtain natural heritage and background planning policy information. A list of documents and information sources consulted for this study is provided below:

- Provincial Planning Statement (2024)
- *Endangered Species Act* (2007) and Ontario Regulation 230/08: Species at Risk in Ontario List (June 2025)
- Ontario Regulation 41/24: Prohibited Activities, Exemptions and Permits (April 2024)
- NPCA Planning and Permitting Procedure Manual (November 2022)
- NPCA Policy Document: Policies for Planning and Development in the Watersheds of the Niagara Peninsula Conservation Authority (April 2024)
- Niagara Official Plan (2022, Office Consolidation 2024)
- Niagara Region Environmental Impact Study Guidelines (January 2018)
- Official Plan of the Township of West Lincoln (2021)
- Subwatershed Study Phase 1: Characterization and Integration, Smithville Subwatershed Study and Stormwater Management Plan (Wood 2023a)
- Subwatershed Study Phase 2: Impact Assessment, Smithville Subwatershed Study and Stormwater Management Plan (Wood 2023b)
- Subwatershed Study Phase 3: Management, Implementation, and Monitoring Plan, Smithville Subwatershed Study and Stormwater Management Plan (Wood 2023c)
- Smithville Master Community Plan,
- Smithville Official Plan Amendments No. 62 & 63 (West Lincoln 2022)
- Natural Heritage Information Centre (NHIC) Database
- Ontario Breeding Bird Atlas (OBBA)
- eBird Atlas
- Ontario Reptile and Amphibian Atlas
- Ontario Butterfly and Moth Atlases
- iNaturalist – NHIC Rare Species of Ontario
- Fisheries and Oceans Canada (DFO) Aquatic Species at Risk Map

3.2. Field Work

GeoProcess staff conducted scoped field studies to characterize and inventory the natural heritage features and wildlife activity of the Subject Property and surrounding landscape. The scoped studies were completed to confirm existing conditions as presented in the Phase 1 SWS and identify any changes to the natural heritage system that may have occurred between the time field work was completed for the SWS and the present. The scoped field studies were also intended to identify if any additional studies are required.

A summary of the field work completed to date for the Subject Property is provided below in Table 2. Field work completed by NRSI for the SWS, specific only to work conducted within the Study Area, has been included.

Table 2. Combined Completed Fieldwork

Activity	Protocol	Date	Start-End Time	Air Temp (˚C)	Beaufort Wind Speed	Cloud Cover (%)	Precip	Staff
Vascular Flora Inventory (Spring) and ELC	Lee et al. (1998), Systematic Search by ELC Polygon	May 12, 2020	07:00-17:00	8	2-3	20-60	None	NRSI P. Deacon, E. Voogjarv
		May 13, 2020	08:00-15:00	10.5	1-3	50	None	
Vascular Flora Inventory (Summer) and ELC	Lee et al. (1998), Systematic Search by ELC Polygon	July 6, 2020	08:00-16:30	18	1-3	50	None	NRSI K. Burrell, P. Deacon
		July 7, 2020	08:00-14:00	32	1-3	0-50	None	
Vascular Flora Inventory (Fall) and ELC	Lee et al. (1998), Systematic Search by ELC Polygon	September 22, 2020	09:00-17:00	9-21	0-2	0	None	NRSI K. Richter, P. Deacon
		September 23, 2020	08:00-16:00	11	0	0	None	
		October 30, 2024	09:00-15:00	22	3	50	None	GeoProcess E. Veres
Breeding Bird Surveys	10 Minute Point Counts and Area Search, Breeding Evidence as per OBBA (2001)	June 8, 2020 (Round 1)	06:30-10:00	12-22	1-2	0-10	None	NRSI K. Richter, K. Burrell, N. Miller
		June 23, 2020 (Round 2)	06:30-10:00	21-25	2-3	10-95	None	NRSI K. Hoo, J. Pickering
	Walking Transect and Area Search, Breeding Evidence as per OBBA (2001)	June 10, 2025 (Round 1)	06:30 – 08:15	22	1-3	0	None	GeoProcess L. Barnett
		June 26, 2025 (Round 2)	06:45-08:01	18	0-0	0	None	
Snake Cover Board Surveys	Surveys with Artificial Cover Objects as per MNRF Protocol (2016)	April 28, 2020 (Install)	16:30-18:30	11-14	2	40	None	NRSI K. Richter, K. Burrell, N. Miller, T. Brenton
		May 20, 2020	18:30-20:30	13-18.5	3-4	0-3	None	NRSI A. Reinert, E-Gosnell, E. Milne, J. McCarter
		June 8, 2020	06:30-11:40	13-21	0-2	0-10	None	NRSI K. Richter, K. Burrell, N.

								Miller, T. Brenton
		June 23, 2020	06:30-10:30	21	1-2	10-20	None	NRSI K. Hoo, J. Pickering
		September 22, 2020	09:00-17:00	9-21	0-2	0	None	NRSI K. Richter, J. Pickering
		September 23, 2020	08:00-16:00	11	0	0	None	NRSI K. Richter, P. Deacon
Headwater Drainage Feature Assessments	HDF Guidelines (TRCA/CVC 2014)	April 2020 (Round 1)	Data Not Available					Matrix
		June 2 and 9, 2020 (Round 2)	Data Not Available					
		August 20 and 26, 2020 (Round 3)	Data Not Available					
		April 9, 2025 (Round 1)	09:30-12:00	7	1-2	40	None	GeoProcess E. Veres, T. Synard
Watercourse Characterization	RGA (MOE 2003) RSAT (Galli 1996)	May 2020	Data Not Available					Matrix
Bat Maternity Roost Assessment	MNRF Guideline (2017) and MECP Guideline (Forests and Woodlands 2022)	October 30, 2024	09:00-15:00	22	3	50	None	GeoProcess E. Veres
Tree Inventory		March 27 and 28, 2025						Stantec

3.2.1. Floristic Studies

An Ecological Land Classification (ELC) with a three-season botanical inventory of all floristic species was completed by NRSI in 2020. NRSI delineated vegetation communities using aerial photography and thorough field investigations. Field surveys were conducted by NRSI on May 12 and 13, July 6 and 7, and September 22 and 23, 2020, as per Appendix B of the Phase 1 SWS Report (Wood 2023). Details of vegetation communities were recorded, including species composition, dominance, presence of uncommon species/features and evidence of human impact.

An additional survey and fall inventory were conducted by GeoProcess on October 11 and October 30, 2024, to confirm observations collected in 2020. For all studies completed for the Subject Property, species nomenclature and ranking were determined provincially by the Ministry of Natural Resources' NHIC Database (S-Ranks). Vegetation communities are mapped and described according to the Ecological Land Classification System for Southern Ontario (Lee et al., 1998). Vegetation community boundaries have been determined using desktop analysis and further refined using field observations. The results of the floristic studies completed by GeoProcess and NRSI are provided in Section 4.4.1.

3.2.1.1. Hedgerow Assessment

An assessment of the hedgerows within the Subject Property was conducted to gather information on the dominant tree species, size range at Diameter at Breast Height (DBH), and to assess their connection to the surrounding landscape. This includes identifying if the hedgerows provide linkage to other natural heritage features, and if they provide habitat for wildlife, including suitable habitat for bats through the presence of snags. Hedgerow assessments were completed by NRSI in 2020, and again by GeoProcess staff on October 30, 2024. The findings are provided in Section 4.4.1.2.

3.2.2. Snake Cover Board Surveys

Snake cover board surveys were conducted by NRSI at suitable locations within the Study Area, particularly focusing on field and woodland edges in meadow and scrubland habitats. Boards measured 1 x 1 m and were black on the top side to increase heat absorption and attract snakes. They were installed on April 20, 2020, and searched on May 20, June 8, June 23, September 22, and September 23, 2020, as per Appendix B of the Phase 1 SWS Report (Wood 2023). Results from two snake cover board locations have been included in this EIS. SNK-21 was established within the northeast extent of the Subject Property and was the only station within the property bounds. SNK-16 was located immediately south of the southern property boundary within the surrounding Study Area.

Snake cover board surveys followed the Ministry of Natural Resources and Forestry (MNRF) Survey Protocol for Ontario's Species at Risk Snakes (2016). Surveys were conducted as per Section 4.2 of the Protocol (Surveys with Artificial Cover Objects). Artificial cover objects (ACOs), or cover boards, are utilized to create suitable microhabitats for snakes that can easily and systematically be searched. As per the protocol, ACOs should be placed in early spring and left for a minimum of two weeks prior to beginning surveys, which are carried out during the spring and early summer. Survey effort can vary depending on target species and study considerations.

3.2.1. Bat Maternity Roost Assessments

GeoProcess staff conducted a bat maternity roost assessment, also referred to as a snag survey, on October 30, 2024, to assess the presence or absence of potential bat maternity roosting habitat within the Subject Property. Surveys were conducted following the MNRF (2017) Protocol for Species at Risk Bats within Treed Habitats as well as the Ministry of Environment, Conservation and Parks (MEC) Treed Habitat Maternity Roosts Survey Protocol (Forest and Woodlands 2022). Per the protocols, this survey was suitable to identify potential maternity roost trees for *Myotis* bats as it occurred during leaf-off conditions.

NRSI conducted searches for high-quality cavity trees, suitable for bat maternity colony roosting, in conjunction with other fieldwork, primarily vegetation inventories, completed during the 2020 field season (Wood 2023). Findings from both GeoProcess and NRSI are presented in Section 4.4.2.

3.2.2. Breeding Bird Surveys

Breeding bird surveys were undertaken on two separate dates by a qualified GeoProcess staff member under appropriate weather conditions in 2025. Four transects were established within the Subject Property to survey the entire area using a travelling count approach to search for birds within the feature, recording presence, abundance, and level of breeding evidence per OBBA protocols. Travelling counts are one of the survey

methods listed under the OBBA and are implemented when the surveyor is travelling more than 50 m. Using the travelling count method, bird surveys were conducted on an 'area search' basis. This approach is also included as an observation type within the OBBA.

Breeding bird surveys were also completed by NRSI on two separate dates in 2020, and data were recorded using standard OBBA call codes (OBBA 2001). Surveys consisted of 10-minute point counts at one station within the Subject Property (BMB-20). The surveys occurred between dawn and 10:00 AM. All visual and auditory observations of birds were recorded, as well as the highest level of breeding evidence exhibited for each recorded species. Birds observed between point count locations were also recorded. The results of both assessments are included in Section 4.4.4.

3.2.3. Incidental Wildlife Surveys

Formal surveys for mammals were not completed, but NRSI staff documented observations of all mammals on all field visits in the 2020 field season. This included direct observations of individuals, as well as signs of animal presence such as tracks, scat, dens, etc. (Wood 2023). GeoProcess staff also recorded incidental observations during the 2024 and 2025 field visits, which can be found in Section 4.4.5.

3.2.4. Headwater Drainage Feature Assessments

Headwater drainage feature assessments were completed following the Toronto and Region Conservation Authority (TRCA) and Credit Valley Conservation Authority (CVC) *Evaluation, Classification and Management of Headwater Drainage Feature Guidelines* (2014) developed in conjunction with the MNRF.

Matrix conducted HDF assessments for identified reaches within the Subject Property in 2020, following the TRCA/CVC guidelines for the Phase 1 SWS Report (Wood 2023). Results provided in the SWS have been included within this EIS. GeoProcess conducted a confirmatory visit in April 2025 to confirm conditions and inform any updates to recommendations. All features were found to be dry or undefined, and as such, no additional data was required.

As per the TRCA/CVC guidelines, up to three rounds may be required for each HDF:

- Visit 1 is conducted during a window of approximately two weeks, during spring freshet. The survey window is typically during late March or early April, but is subject to variation depending on the weather in any given year. During the first site visit, the identified drainage lines are examined for both the flow condition and feature type. The first visit determines if a second HDF evaluation is necessary. If the feature is dry or standing water, or if there is no defined feature present, the feature would likely be considered as "limited functions" and no additional data is required; therefore, no further field visits are required. If the feature exhibits functions beyond the "limited functions" criteria, such as a defined flow path and active flow, further data collection is then required to define those functions more fully.
- Visit 2 is conducted after the freshet has ended, when the melt/thaw-related interflow has ceased, and, preferably, after a few days with no precipitation. Timing of this visit should occur before spring plant growth is very far advanced to permit unobstructed examination of features and is typically from late April through mid-May. During this site visit, flow conditions and fish presence are assessed.

- Visit 3 is conducted if water was present in the feature during the second round. The timing of the third visit is from July to mid-September, preferably after several days without a significant (i.e., flow generating) amount of rain. During this site visit, flow conditions and fish presence are assessed. The presence of flow during this visit automatically results in classification as an "important" feature, so fish presence has no effect on management recommendations. Where isolated standing pools exist, sampling should be conducted, as described for site visit 2 (above), to determine the upstream limit of year-round fish utilization.

The data and observations collected from site visits are used to inform a series of classifications of the feature in relation to its function regarding hydrology, riparian character, fish and fish habitat, and terrestrial habitat. These classifications are then used to navigate a flow chart (Figure 1) that determines the most appropriate management approach for the feature. Management approaches can range from protection in situ to "no management" requirements (i.e., removal is possible), with interim management approaches that include replication of form and function or replication of function alone.

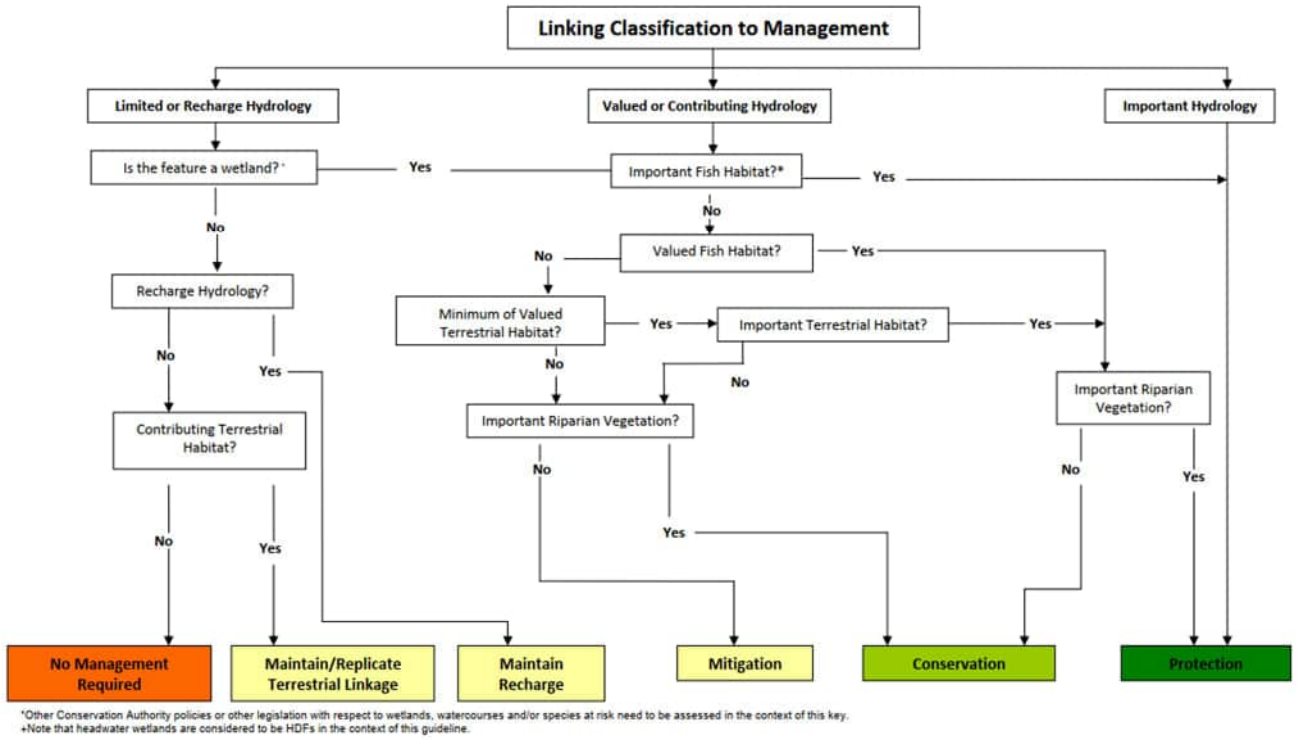


Figure 1. Flow chart providing direction on management recommendations (OSAP).

3.2.5. Watercourse Characterization

An assessment and characterization of the watercourse feature's habitat qualities and function was completed by NRSI in 2020, following the Ontario Stream Assessment Protocol (OSAP). Background information and secondary sources, including the MNRF and NPCA fish records, were utilized to further characterize the watercourse. An active fish community assessment was not completed (i.e. electrofishing) within the immediate Study Area. It should be noted that no stations were assessed within the Study Area bounds. The closest assessments were completed downstream at the confluence with Twenty Mile Creek (Stations EMS-14, EMS-15, and AHP-005). As the conditions observed at this location are not reflective of

the Subject Property, they have not been included within this report and have been reviewed as reference only.

Watercourse characterizations combined both ecological and fluvial geomorphological observations to identify a constraint ranking. Matrix also followed Rapid Geomorphic Assessment (RGA) and Rapid Stream Assessment Technique (RSAT) for characterizations of existing geomorphic conditions. An integrated assessment was completed, combining watercourse and headwater drainage feature assessments to determine constraint classifications for the water resources present in the Study Area. Although the MNRF Watercourse Classification was Unclassified for the features present on the Subject Property (Map NH-8 Wood 2023a), aquatic habitat was assessed through other watercourse assessments. Constraint rankings were based on available fisheries and terrestrial information.

3.3. Tree Inventory

A tree inventory was conducted by Stantec Consulting Ltd. (Stantec) on March 27 and 28, 2025, to assess trees located within the Subject Property and trees on adjacent lands that the proposed development may impact. Trees 10 cm in diameter at breast height (DBH) and greater located within the Study Area were tagged and recorded in a Detailed Tree Inventory (DTI). The data collected for each tree includes tree genus, species (where possible to determine accurately), trunk integrity, crown structure, crown vigour, general health condition, DBH, and dripline radius. Tree locations were surveyed and recorded. A Tree Management Plan (TMP) was developed to include recommended actions for each inventoried tree. The full arborist report prepared by Stantec is provided in Appendix E.

3.4. Species at Risk Screening and Assessment

An assessment and screening of potential Species at Risk was conducted for the Property based on Federal and Provincial status. Following the MECP Client's Guide to Preliminary SAR Screening (2019), this screening was based on a review of the NHIC, regional species list, atlases (e.g., OBBA, butterfly, moth, reptile and amphibian), citizen science databases (e.g., iNaturalist, eBird), and any additional provided lists. Data sources utilized for screening are described in Appendix A. The SAR assessment results are further discussed in Section 4.5.

3.5. Significant Wildlife Habitat Screening and Assessment

A screening for Significant Wildlife Habitat (SWH) following the MNRF Significant Wildlife Habitat Technical Guide (MNRF 2000) and Significant Wildlife Habitat Criteria Schedule for Ecoregion 7E (MNRF 2015) was conducted for the Subject Property based on the results of the wildlife and vegetation surveys. The results of the SWH evaluation are presented in Section 6 and Appendix C.

4. Existing Conditions

The following describes the existing and historical conditions of the Study Area. It summarizes the results of field surveys and analyses described in Section 3, completed to characterize the natural heritage features and their functions within the Study Area.

4.1. General Landscape Position

The Subject Property is in the southern part of Smithville, the largest urban center in the Township of West Lincoln, Ontario. Smithville is situated on the Niagara Peninsula, a geographical area bounded by Lake Ontario, Lake Erie, and the Niagara River. This region is bisected by the Niagara Escarpment, which divides it into two distinct physiographic regions: the Ontario Plain to the north and the Erie Plain to the south. The Subject Property is located on the Erie Plain, a landscape characterized by poorly drained clay soils and shallow bedrock.

The Subject Property is approximately 800 m west of Highway 20. It's bordered by Townline Road to the north and Shurie Road to the east. The surrounding land use is primarily agricultural, with the urban and residential area of Smithville to the north and a smaller residential area to the east.

Two watercourses regulated by the Niagara Peninsula Conservation Authority (NPCA) are located nearby:

- Twenty Mile Creek, about 500 m east of the property.
- North Creek, a tributary of Twenty Mile Creek, approximately 850 m south of the property.

These watercourses represent the most prominent landscape corridors in the area. Significant woodlands and a Provincially Significant Wetland (PSW), classified as Natural Heritage Features, are located south of the property boundary. The surrounding landscape has limited ecological corridors. The Subject Property is positioned between the Twenty Mile Creek and North Creek corridors.

4.2. Physiography and Geology

The Subject Property is located within the Haldimand Clay Plain physiographic region of Southern Ontario. This region is part of the larger Erie Plain, situated south of the Niagara Escarpment (Chapman and Putnam 1984). The Haldimand Clay Plain is characterized by its exceptionally flat topography and heavy clay soils, which are derived from the sediments of glacial Lake Iroquois. The surface drainage is generally poor due to the impermeable nature of the clay, with shallow, slow-moving watercourses through the region. The surficial geology of the Subject Property is composed of these fine-textured, glaciolacustrine clay deposits. The bedrock underlying the Smithville area consists of dolostones and shales, sloping from north to south (Wood 2023). Due to the tight soils, the property is not identified as a Significant Groundwater Recharge Area (SGRA) or a Highly Vulnerable Aquifer (HVA). A small portion of the northern boundary is identified as a HVA, with a vulnerability score of 6 according to the Stantec 2025 Hydrogeologic report.

The SWS identified karst hazards present near the Subject Property. Terra-Dynamics Consulting Inc. completed a karst assessment of the property and identified a sink hole in the northwest area of the Subject Property that was 5.1 m in length, 4.3 m in width and 2.0 m in depth. They stated that there were no impediments to remediating or closing out the feature.

4.3. Natural Heritage System

A Natural Heritage System (NHS) was delineated in Phases 2 and 3 of the Smithville Subwatershed Studies, prepared by Wood (2023). Within the Subject Property boundary, a Linkage connects the Twenty Mile Creek and North Creek stream corridors to the north and south, respectively. A Significant Woodland and PSW are also located south of the Study Area.

4.3.1. Linkage

The SWS Phase 3 report describes linkages as *"connections between natural heritage features allowing for movement of species between habitats"*. Many of the natural heritage features within the Smithville SWS are isolated but connected through an agricultural matrix, which provides a porous matrix for wildlife movement between habitat units. These linkages are crucial for supporting species at various life stages and for promoting population movement and ecological diversity.

The SWS identifies two types of linkages:

- Primary Linkages: Mapped as 200 m wide.
- Secondary Linkages: Mapped as 50 m wide.

SWS Linkage #40, located along the eastern boundary of the Subject Property, is classified as a Secondary Linkage. It provides a connection between Significant Woodland #41 and PSW #42. The Linkage was proposed to connect to the larger Twenty Mile Creek Corridor (#20) and North Creek corridor, which are located to the north and south of the Subject Property, respectively (refer to Map 2).

Based on a review of the site conditions, consideration should be given to relocated the Secondary Linkage within the SWS area to mitigate potential risks that have been identified with the having the linkage on the Subject Property. The original proposed linkage was situated to cross Townline Road, a heavily travelled collector road. This road serves as a key connector between local residential streets and Highway 20, a major arterial route. Establishing a dedicated linkage in this location would promote the movement of larger wildlife across a high-volume road, significantly increasing the risk of wildlife-vehicle collisions. Additionally, a residential park situated north of Townline Road, along Rock Street, could create a physical and behavioural barrier, disrupting the intended connection to the Twenty Mile Creek corridor. Currently, a large fence is present along the park boundary on the north side of Townline Road, directly opposite the proposed linkage. The fenced boundary of the park would further restrict the movement of large wildlife.

While the Subject Property may not be a good candidate for a SWS Secondary Linkage, a vegetated, multi-use corridor has been provided along the eastern property limit along the former rail corridor. This linkage will be planted with native vegetation, providing many of the ecological services a Secondary Linkage is intended to provide. This is discussed further in Section 7.1.

4.3.2. Significant Woodland

A Significant Woodland is located south of the Subject Property and Townline Road and north of Sixteen Road. The natural heritage feature is designated as a Significant Woodland due to its size, at approximately 7.7 ha, and it contains a provincially significant wetland (PSW) at the southern extent. It also contains an HDF with a conservation management recommendation, as well as an identified Significant Wildlife Habitat due to the presence of provincially rare plant species Slightly Hirsute Sedge (*Carex hirsutella*) and Eastern Wood-pewee (*Contopus virens*), a bird species of Special Concern (Wood 2023). It was determined that approximately 1.5 ha of the Significant Woodland was removed, and as such, the area has been identified in the SWS as a Recommended Restoration Area (#41). The Recommended Restoration Area extends into the southeastern portion of the Subject Property.

4.4. Field Work

4.4.1. Floristic Studies

The ELC communities for the Subject Property are shown on Map 4. The ELC communities are based on the vegetation characterizations provided by NRSI in the SWS and verified by GeoProcess (Table 3).

Table 3. ELC Communities

ELC Code and Classification	Layer	Vegetation	Comments
CUW: Cultural Woodland	Ground	Tall Goldenrod (*Solidago altissima*), Wild Teasle (*Dipsacus fullonum*), Canada Thistle (*Cirsium arvense*), New England Aster (*Symphyotrichum novae-angliae*), Reed canary Grass (*Phalaris arundinacea*), Greater Burdock (*Arctium lappa*), Enchanter's Nightshade (*Circaea canadensis*), Kentucky Bluegrass (*Poa pratensis*), and Sedge sp. (*Carex sp.*).	Old homestead that has begun to naturalize
	Sub-canopy	Staghorn Sumac (*Rhus typhina*), Red Raspberry (*Rubus idaeus*), Black Raspberry (*Rubus occidentalis*), Tartarian Honeysuckle (*Lonicera tartaricus*), and Grapevine (*Vitis riparia*).	
	Canopy	Manitoba Maple (*Acer negundo*), and Choke Cherry (*Prunus virginiana*).	
FOD7: Manitoba Maple Woodland	Ground	Tall Goldenrod, Virginia Wild Rye (*Elymus virginicus*), Aster sp. (*Symphyotrichum sp.)*, Wood Avens (*Geum canadensis*), Dame's Rocket (*Hesperis matronalis*), and Kentucky Bluegrass.	
	Sub-canopy	Grapevine, Tartarian Honeysuckle, Black Raspberry, Red Raspberry, Grey Dogwood (*Cornus racemosa*), European Buckthorn (*Rhamnus cathartica*), and Guelder Rose (*Viburnum opulus*).	
	Canopy	Manitoba Maple, Apple Tree (*Malus sp.*), White Ash (*Fraxinus americana*), and Bur Oak (*Quercus macrocarpa*).	
MAM: Meadow Marsh at Culvert Inlet	Ground	Queen Anne's Lace (*Daucus carota*), Purple Vetch (*Vicia cracca*), Lance-leaved Aster (*Symphyotrichum lanceolatum*), Reed Canary Grass, Tall Goldenrod, Poa sp., Wild Teasle, Virginia Wild Rye, Canada Thistle, Self Heal (*Prunella vulgaris*), Fringed Willowherb (*Epilobium ciliatum*), and Wood Avens.	
	Sub-canopy	Tartarian Honeysuckle, Red Osier Dogwood (*Cornus sericea*), and Black Raspberry.	
	Canopy	White Ash.	
CUT1-4:	Ground	Tall goldenrod, Grass-leaved Goldenrod (*Euthamia graminifolia*), Queen Anne's Lace, Field Strawberry	Former railway corridor

ELC Code and Classification	Layer	Vegetation	Comments
Gray Dogwood Cultural Thicket		(*Fragaria virginiana*), Wild Teasle, Aster sp., Cattail Hybrid (*Typha X glauca*), Reed Canary Grass, Dame's Rocket, Greater Burdock, Smooth Brome (*Bromus inermis*), and Self Heal.	
	Sub-canopy	Gray Dogwood, European Buckthorn, Tartarian Honeysuckle, Red Osier Dogwood, Guelder Rose, Common Privet (*Ligustrum vulgare*), Black Raspberry, and Multiflora Rose (*Rosa multiflora*).	
	Canopy	Apple Tree, Bird Cherry (*Prunus avium*), White Elm (*Ulmus americana*), Manitoba Maple, Black Walnut (*Juglans nigra*), Norway Maple (*Acer platinoides*), White Ash, and Red Maple (*Acer rubrum*).	
MAMM1-3: Reed Canary Meadow Marsh	Ground	Reed Canary Grass, Tall Goldenrod, Wild Teasle, Crispy Dock (*Rumex crispus*), Canada Thistle, Bull Thistle (*Cirsium vulgare*), White Heath Aster (*Symphyotrichum pilosum*), Poa sp., Common Milkweed (*Asclepias syriaca*), New England Aster, and Queen Anne's Lace.	
	Sub-canopy	Tartarian Honeysuckle, Red Raspberry, European Buckthorn, and Common Lilac (*Syringa vulgaris*).	
	Canopy	Hawthorn sp., (*Crataegus sp.*).	

CUW: Cultural Woodland

This community was observed at the northern edge of the property along Townline Road. It is the location of an old homestead with sections of concrete foundation still present. The only species present in the canopy and sub-canopy was the Manitoba maple (*Acer negundo*). The understory included an occasional abundance of black raspberry (*Rubus occidentalis*), chokecherry (*Prunus virginiana*), and staghorn sumac (*Rhus typhina*). Much of the ground layer consisted of tall goldenrod (*Solidago altissima*) and Kentucky bluegrass (*Poa pratensis*).

FOD7: Manitoba Maple Forest

This community was observed at the northern edge of the property along Townline Road and abutting the CUW community. It is the location of an old homestead with sections of concrete foundation still present. The canopy and sub-canopy were dominated by Manitoba maple (*Acer negundo*) with occasional presence of apple trees (*Malus sp.*) in the canopy. The understory consisted of an occasional abundance of invasive honeysuckle (*Lonicera tartarica*) and black raspberry (*Rubus occidentalis*). The ground layer consisted of an abundant amount of tall goldenrod (*Solidago altissima*) and an occasional abundance of white avens (*Geum canadense*) and Virginia wildrye (*Elymus virginicus*).

MAM: Meadow Marsh

The meadow marsh is located at the inlet of the culvert that goes under Townline Road. It contains an abundance of red-osier dogwood (*Cornus sericea*) in the shrub layer, with wild teasel (*Dipsacus fullonum*) and tall goldenrod (*Solidago altissima*) as the dominant species present in the ground layer.

MAMM1-3: Reed Canary Meadow Marsh

This community was located along the northern edge of the Subject Property behind the houses on Townline Road. It is a small section, approximately 530 m^2 in size, situated between the backyards of three residences where HDFs from the agricultural lands drain to. The community is dominated by reed canary grass (*Phalaris arundinacea*) with occasional abundances of grass species (*Poa sp.*), tall goldenrod (*Solidago altissima*), and aster species (*Symphyotrichum sp.*). A few shrubs exist on the western side of the community, most of which are hawthorn species (*Crataegus sp.*).

CUT1-4: Gray Dogwood Cultural Thicket

This community is situated along the eastern edge of the Subject Property, along the decommissioned railway line. The area is now a ditch between the agricultural fields and the backyards of residential houses on Shurie Road and has been identified as a Linkage within the Smithville Natural Heritage System. It is a narrow strip of land with less than 50% cover of young trees comprised mainly of two species: American elm (*Ulmus americana*) and black walnut (*Juglans nigra*). The shrub layer consists of an abundance of gray dogwood (*Cornus racemosa*) and two invasive species: common buckthorn (*Rhamnus cathartica*) and honeysuckle (*Lonicera tartarica*).

The ground layer species vary as the community transitions between shrub-dominated to open/mowed areas. Cattails (*Typha x glauca)* are present in some sections along the length of the ditch feature. Other ground layer species include tall goldenrod (*Solidago altissima*), wild strawberry (*Fragaria virginiana*), and Lance-leaved Aster (*Symphiotrichum lanceolatum*).

One snag along this feature may provide suitable bat habitat as it is approximately 15 m in height with loose/exfoliating bark (Figure 5).

4.4.1.1. Other Woodlands

The FOD7 and CUW have been assessed to determine if they meet the criteria for *Other Woodland* as per the Niagara Official Plan. The criteria in the OP are provided in Schedule L and are as follows:

To be identified as an other woodland, a terrestrial treed area must have ≥ 25 per cent tree cover and meet one or more of the following criteria:

a. an average minimum width of 40 m and is ≥ 0.3 ha, measured to crown edges; or

b. any size abutting a significant woodland, wetland or permanent stream.

Treed areas that "abut" a significant woodland, wetland or permanent stream are considered adjacent when located within 20 m of each other.

Other woodlands are identified based on the Ecological Land Classification methodology. Terrestrial vegetation communities that would meet the ≥ 25 per cent tree cover are identified in Table 5-1.

The wooded feature on the Subject Property has been identified as having two units, an FOD and a CUW. Only the FOD unit is listed in Table 5.1 of Schedule L. This community is approximately 0.22 ha in size, which is below the size criteria for qualifying as 'Other Woodland'. As a result, the wooded feature in the north end of the property is not considered an *Other Woodland*, as per the Niagara OP.

4.4.1.2. Hedgerow Assessment

Two hedgerows exist within the Study Area (Map 4). Hedgerow 2 was surveyed by NRSI in 2020, and Hedgerows 1 and 2 were surveyed by GeoProcess staff on October 30, 2024.

Hedgerow 1: Drainage Hedgerow

This hedgerow is located on the Subject Property facing in the north-south direction off Townline Road. The entire hedgerow is approximately 10 m to 12 m wide and 115 m in length.

The treed section of the hedgerow consists mainly of sugar maple (*Acer saccharum*) and American elm (*Ulmus americana*) trees in the canopy and sub-canopy, with an abundance of gray dogwood (*Cornus racemosa*), common buckthorn (*Rhamnus cathartica*), and invasive honeysuckle (*Lonicera tartarica*) in the understory. The main species in the ground layer include tall goldenrod (*Solidago altissima*), gray dogwood (*Cornus racemosa*), and common buckthorn (*Rhamnus cathartica*).

The representative DBH of the trees along this hedgerow ranges from 15 to 30 cm, with a few larger trees of up to 100 cm DBH. One living shagbark hickory and one deciduous snag occur within the hedgerow, ranging in heights from approximately 6 to 20 m tall, with DBH of approximately 12 to 35 cm. Both trees provide suitable bat habitat with exfoliating bark on the living Shagbark Hickory, and exfoliating bark, cracks and small cavities in the deciduous snag (Figure 2 and Map 3). Other trees with snag-like qualities exist within this hedgerow; however, none provide suitable habitat for bats. The mapped watercourse TM3(1)3 runs adjacent to a portion of the hedgerow before entering a culvert that goes underneath Townline Road.

Hedgerow 2: West Hedgerow

This hedgerow is located just west of the Subject Property and is approximately 10 m wide and 230 m in length. Shagbark hickory (*Carya ovata*) and American elm (*Ulmus americana*) are the most abundant species in both the canopy and sub-canopy, with a few sugar maples (*Acer saccharum*) throughout. The understory contains an abundance of hawthorn (*Crataegus sp.*) and an occasional gray dogwood (*Cornus racemosa*). The ground layer contained mostly smooth brome (*Bromus inermis*) and tall goldenrod (*Solidago altissima*).

This hedgerow is connected to two other hedgerows on the west, outside of the Subject Property, and two HDFs occur to the east of this feature (TM3(1)6-3 and TM3(1)7-1). The representative DBH ranges from approximately 20 to 60 cm. Two living shagbark hickories with loose exfoliating bark and one snag (Figure 4) occur within the hedgerow. All three trees provide potential bat roosting habitat. Other trees within the hedgerow showed minor signs of being suitable bat habitat (loose bark, decay class higher than 2, knot

holes, cavities, etc.); however, not enough to qualify as suitable bat habitat. All snags range from approximately 14 to 30 cm DBH and vary in height.

4.4.2. Bat Maternity Roost Assessment

A snag survey was completed for the Subject Property by GeoProcess during leaf-off conditions to assess for potential bat habitat. The survey included an assessment of dead standing trees (snags) with a DBH of 10 cm or greater with loose or exfoliating bark, cavities, hollows, or cracks that provide suitable bat maternity roosting habitat.

Six snags were identified as suitable bat roosting habitat as they were greater than 15 m in height with loose/exfoliating bark and cracks (Table 4 and Map 3). In addition, several living shagbark hickory trees with exfoliating bark were found throughout the site, mainly along Hedgerow 2, which could provide potential bat habitat.

Table 4. Snag Survey Results

Snag #	Common Name	DBH (cm)	Height (m)	Notes
1	Sugar Maple	35	20	Contained a split in the trunk, small cavities and loose/exfoliating bark
2	Deciduous Tree	90	20	Cracks and loose/exfoliating bark with some branches falling off
3	Ash *sp.*	30	20	Loose/exfoliating bark
4	Deciduous Tree (likely Ash *sp.*)	25	15	Loose/exfoliating bark
5	Shagbark Hickory	52	20	Living tree with loose/exfoliating bark
6	Shagbark Hickory	51	20	Living tree with loose/exfoliating bark

Figure 2. Snag 1

Figure 3. Snag 2

Figure 4. Snag 3

Figure 5. Snag 4

Figure 6. Snag 5

Figure 7. Snag 6

4.4.3. Snake Cover Board Surveys

NRSI conducted snake board surveys during the 2020 field season. Two snake boards (SNK-21, SNK-16) were placed within the Subject Property, one in the northeast corner and one on the southern property border (Map 3).

No snake observations were made at SNK-21. Blackport & Associates staff observed approximately 20 Garter snakes in the vicinity of SNK-16 on April 6, 2020, and reported to the SWS project team. The snakes were observed in the agricultural field, as well as along the former railway line, likely indicating a hibernaculum nearby (Appendix B, Wood 2023). Since the snake observations were made, the woodland feature where the hibernaculum was most likely located has been removed, and it is unknown if this habitat feature is still present.

4.4.4. Breeding Bird Surveys

Breeding bird surveys were conducted on two separate dates within the Study Area by GeoProcess under suitable conditions between 5 am and 10 am as per OBBA protocols (Table 5). Four breeding bird transects were established for the Study Area to survey all habitat types (Map 3). One species at risk was found within the Study Area.

Table 5. Breeding Bird Survey Conditions

Visit Date	Visit Time	Wind Speed [Beaufort scale]	Rain	Noise Code (1-5)
June 6, 2025	06:30-07:52	2-3	0-0	2-3
June 26, 2025	06:45-08:01	0-0	0-0	2-3

Species heard and or observed within the search area were recorded, and the highest level of breeding evidence (following OBBA protocols) was determined after completion of both surveys. Results are presented in Table 6 below. Species at Risk in Ontario (SARO) and Committee on the Status of Endangered Wildlife in Canada (COSEWIC) rankings were attributed to each species.

Table 6. Breeding Bird Survey Results

Common Name	Scientific Name	T1		T2		T3		T4		T5		S-Rank*	SARO	COSEWIC
		Q	BE	Q	BE	Q	BE	Q	BE	Q	BE			
American Goldfinch	*Spinus tristis*	2	S	2	A	1	S			2	P	S5		
American Robin	*Turdus migratorius*	12	FY	17	NY	6	FY	17	FY	8	CF	S5		
Baltimore Oriole	*Icterus galbula*	1	H	1	S			3	FY	1	S	S4B		
Barn Swallow	*Hirundo rustica*			1	S			1	S	13	D	S4B	SC	SC
Black-capped Chickadee	*Poecile atricapillus*			1	S							S5		
Blue Jay	*Cyanocitta cristata*	1	S	5	A	1	S			1	S	S5		
Brown-headed Cowbird	*Molothrus ater*	5	A	6	FY	6	P	4	S	1	S	S5		
Canada Goose	*Branta canadensis*					50+	F	2	H			S5		
Cedar Waxwing	*Bombycilla cedrorum*	5	S	2	P			1	S	1	S	S5		
Chimney Swift	*Chaetura pelagica*					3	S					S3B		THR
Chipping Sparrow	*Spizella passerina*	3	S	2	T			1	H	1	S	S5B, S3N		
Common Grackle	*Quiscalus quiscula*	16	FY	10	NY	5	P	5	NY	1	S	S5		
European Starling	*Sturnus vulgaris*	8	FY	8	P	6	S	11	CF	7	P	SNA		
Eastern Meadowlark	*Sturnella magna*									1	S	S4B, S3N		THR
Gray Catbird	*Dumetella carolinensis*	2	T					1	S	1	S	S5B, S3N		
House Finch	*Haemorhous mexicanus*	3	T	3	S	1	S	1	S			SNA		
House Sparrow	*Passer domesticus*	3	S	5	S	10	A					SNA		

Common Name	Scientific Name	T1		T2		T3		T4		T5		S-Rank*	SARO	COSEWIC
		Q	BE	Q	BE	Q	BE	Q	BE	Q	BE			
Horned Lark	*Eremophila alpestris*									2	T	S4		
Killdeer	*Charadrius vociferus*			4	DD	3	DD	4	A	5	DD	S4B		
Mourning Dove	*Zenaida macroura*	1	H	7	T	5	S	1	S	5	FY	S5		
Northern Cardinal	*Cardinalis cardinalis*	5	NY	1	S	2	S					S5		
Northern Flicker	*Colaptes auratus*									1	S	S5		
Red-winged Blackbird	*Agelaius phoeniceus*	6	A	2	A	9	A	8	A	1	S	S5		
Ring-billed Gull	*Larus delawarensis*			2	F			1	S			S5		
Savannah Sparrow	*Passerculus sandwichensis*			1	S	1	S	4	S	3	T	S5B, S3N		
Song Sparrow	*Melospiza melodia*	6	T	3	S	4	A	6	A	8	S	S5		
Vesper Sparrow	*Pooecetes gramineus*			3	T					2	T	S4B		

In the species columns, Breeding Evidence (BE) was identified for each species based on the highest level of BE observed. The number recorded represents the highest one-day total for that species with the associated breeding code. A species observed, showing no breeding evidence or where no suitable habitat is present, is marked 'X'. The number recorded represents the highest one-day total for that species.

**The S-Rank is a subnational conservation status rank for species in Ontario. The S-rank system is used to describe how rare a species is in the province, with S1 species being extremely rare and S5 species being demonstrably secure.*

Species status was evaluated using the following sources:

- The COSEWIC list for national status designations
- SARA federally listed species
- The COSSARO list for provincial status designations
- The NHIC Database/Biodiversity Explorer for provincial rarity ranks (i.e. S-Ranks)

Descriptions of OBBA breeding evidence codes, NHIC S-Ranks, COSEWIC, and COSSARO rankings can be found in Appendix C.

During the field surveys, 27 summer resident bird species were observed, all with some breeding evidence. Three of the observed species: barn swallow, chimney swift, and eastern meadowlark, are of conservation concern. Species of conservation concern include those that are designated by COSEWIC and/or listed under SARA, species designated by COSSARO, including Endangered, Threatened, and Special Concern species listed and regulated under Ontario's ESA, and provincially rare species (NHIC S-Rank of S1 to S3). Two non-native species, the European starling (*Sturnus vulgaris*) and the house sparrow (*Passer domesticus*), were detected. Canada geese were observed flying over the study site.

The highest level of breeding evidence observed during surveys was the "confirmed" breeding of eight species, based on the observations of distraction displays (DD), adults carrying food for young (CF), nests with young seen or heard (NY), and fledged young (FY). Thirteen species were observed exhibiting "probable" breeding behaviour as pairs observed in their breeding season in suitable habitat (P), on territory (T), doing a display (D), and exhibiting agitated behaviour or anxiety calls (A). Six residents were observed in suitable habitat (H) during the breeding season, or a singing male was present in the breeding season in suitable habitat (S), indicating "possible" breeding evidence (OBBA, 2001). One species was observed as a flyover (F).

Based on the breeding bird surveys, no suitable habitat for the species of conservation concern is present on the Subject Property. Barn swallows almost exclusively use human-made structures to mount their cup-shaped mud nests on and require open meadows/fields for hunting. Chimney swifts historically nested on cave walls and in tree cavities of snags in old-growth forests; however, upon European settlement, the species adapted to nesting in chimneys and on human-made structures, which are no longer present on the Subject Property. Eastern meadowlarks nest in moderately tall grasses or pastures of alfalfa and hay, while using shrubs and snags for perching and singing. All three SAR were observed exhibiting possible breeding behaviour (e.g. singing males), but they are likely breeding elsewhere and were travelling through the Study Area or using it to forage. Otherwise, the Study Area provides habitat for species that are generally considered "apparently secure" (S4) and "secure" (S5).

4.4.4.1. NRSI Breeding Bird Surveys

Breeding bird surveys were previously completed for the Study Area by NRSI in 2020 following OBBA protocols (Wood 2023a). One breeding bird station was located within the Subject Property along the eastern border of the old railway line labelled BMB-20 (Map 3). The results of this assessment have been included for comparative analysis and have been transcribed from Appendix B of the SWS Phase 1 Report (Wood 2023a) into Table 7 below.

Table 7. NRSI Breeding Bird Survey Results for Station BMB-20 (Appendix B, Wood 2023a)

Common Name	Scientific Name	Highest Level of Breeding Evidence Observed	S-Rank	SARO	COSEWIC
Mourning Dove	*Zenaida macroura*	PR	S5		
Killdeer	*Charadrius vociferus*	PO	S5B,S4N		
Turkey Vulture	*Cathartes aura*	OB	S5B		
Warbling Vireo	*Vireo qilvus*	PR	S5B		
Blue Jay	*Cyanocitta cristata*	PR	S5		
Barn Swallow	*Hirundo rustica*	PO	S5B	SC	SC
Black-capped Chickadee	*Poecile atricapillus*	PO	S5		
American Robin	*Turdus migratorius*	PR	S5B		
European Starling	*Sturnus vulgaris*	PR	SNA		
Cedar Waxwing	*Bombycillia cedrorum*	PO	S5B		
House Sparrow	*Passer domesticus*	PO	SNA		
American Goldfinch	*Spinus tristis*	PR	S5B		

Common Name	Scientific Name	Highest Level of Breeding Evidence Observed	S-Rank	SARO	COSEWIC
Song Sparrow	*Melospiza melodia*	PR	S5B		
Chipping Sparrow	*Spizella passerina*	PO	S5B		
Red-winged Blackbird	*Agelaius phoeniceus*	PO	S4		
Baltimore Oriole	*Icterus galbula*	PO	S4B		
Brown-headed Cowbird	*Molothrus ater*	PO	S4B		
Common Grackle	*Quiscalus quiscala*	CO	S5B		
Northern Cardinal	*Cardinalis cardinalis*	PO	S5		

Out of the 19 summer resident bird species (all with some breeding evidence), one SAR was observed, the barn swallow (*Hirundo rustica*). One non-native species, the European starling (*Sturnus vulgaris*), was also recorded. Barn swallow habitat was not present on the Subject Property, and the individuals were likely feeding on site and nesting on nearby infrastructure (as stated in Section 5.2.1.1 of the SWS Phase 1 Report).

The highest level of breeding evidence obtained during surveys was “confirmed” breeding (OBBA, 2001); this evidence was obtained for one species (common grackle). Seven species were observed exhibiting “probable” breeding behaviour as pairs observed in their breeding season in suitable habitat (P), singing in permanent territory during both rounds of surveys (T), and exhibiting agitated behaviour or anxiety calls (A). The remaining 11 summer residents were observed exhibiting “possible” breeding behaviour such as singing (S) in suitable habitat (H) during the breeding season, indicating “possible’ breeding evidence (OBBA, 2001).

Based on the breeding bird surveys, the Subject Property provides habitat for species that are considered “apparently secure” (S4) and “secure” (S5). These species are generally considered to be urban-tolerant and do not require specialized habitats.

The results of the breeding bird surveys conducted by NRSI in 2020 for the SWS on the Subject Property generally align with the results of surveys completed by GeoProcess in 2025. No habitat for species of conservation concern was identified during either investigation.

4.4.5. Incidental Wildlife

Incidental wildlife was recorded by GeoProcess staff during the site visit on October 30, 2024. The observations are provided in Table 8.

Table 8. Incidental Wildlife

Common Name	Scientific Name	Evidence	Abundance
Northern Cardinal	*Cardinalis cardinalis*	Visual/Audio	3
Dark-eyed Junco	*Junco hyemalis*	Visual/Audio	16
House Sparrow	*Passer domesticus*	Visual/Audio	10
Song Sparrow	*Melospiza melodia*	Visual/Audio	1
Mourning Dove	*Zenaida macroura*	Visual/Audio	3

Common Name	Scientific Name	Evidence	Abundance
Turkey Vulture	*Cathartes aura*	Visual	2
Red-tailed Hawk	*Buteo jamaicensis*	Visual/Audio	1
Eastern Gray Squirrel	*Sciurus carolinensis*	Visual	1

All species observed are common and typical of urban or anthropogenically disturbed landscapes. No observed species is an indicator of sensitive or significant habitat conditions.

4.4.6. Headwater Drainage Feature Assessment

The HDF assessment for the Study Area was performed by Matrix in 2020. Results of the HDF assessment and classification were reported in the SWS Phase 2 Report (Wood 2023b), and a summary of findings presented in the SWS can be found below.

4.4.6.1. HDF Classification and Evaluation

The 2014 HDF Guidelines provide a classification system for the HDF features based on the field data collected. The classification involves a four-step process which considers hydrology, riparian vegetation, fish habitat, and terrestrial habitat. These four classification steps are then used to assign a recommended management approach. Table 9 below summarizes the classification for each of the HDFs found on the Subject Property and has been transcribed from data included in the SWS. All figures, tables and supporting documents from the SWS report can be found in Appendix A. Mapping of HDFs within the Subject Property can be found on Map 5.

Green streams (HDFs) are identified as Mitigation Features in the SWS. These features are typically highly modified but provide some downstream function (e.g. supply of sediment and water, or seasonal fish habitat). Some complexities, like tile drains, can be replicated through a stormwater management (SWM) strategy, while fish habitat may be replicated within another nearby feature, or downstream in the floodplain (e.g. pond creation). All HDFs within the Subject Property have been modified through agricultural practices; therefore, it is recommended that the function of downstream features is maintained (Wood 2023b).

Table 9. HDF Guidelines Classification System for HDFs on Subject Property (Wood 2023b)

HDF #	STEP 1		STEP 2	STEP 3	STEP 4	Management Recommendation (Figure 2)	Rationale
	Hydrology	Modifiers	Riparian	Fish Habitat	Terrestrial Habitat		
TM3(1)4	Contributing Functions	Agricultural practices	Contributing Functions	Contributing Functions (no fish habitat)	Limited Functions	Mitigation	Linkage to wetland upstream.
TM3(1)5	Contributing Functions	Agricultural practices	Valued Functions	Contributing Functions (no fish habitat)	Limited Functions	Mitigation	Linkage to wetland upstream.
TM3(1)6	Contributing Functions	Agricultural practices	Limited Functions	Contributing Functions (no fish habitat)	Limited Functions	Mitigation	

HDF #	STEP 1		STEP 2	STEP 3	STEP 4	Management Recommendation (Figure 2)	Rationale
	Hydrology	Modifiers	Riparian	Fish Habitat	Terrestrial Habitat		
TM3(1)6-1	Contributing Functions	Agricultural practices	Limited Functions	Contributing Functions (no fish habitat)	Limited Functions	Mitigation	
TM3(1)6-1-1	Contributing Functions	Agricultural practices	Limited Functions	Contributing Functions (no fish habitat)	Limited Functions	Mitigation	
TM3(1)6-1-2	Contributing Functions	Agricultural practices	Limited Functions	Contributing Functions (no fish habitat)	Limited Functions	Mitigation	Dry defined channel in April (then plowed). Considered to have contributing hydrology although dry in April due to channel form, and anecdotal evidence from residents of recent high flows prior to April site visit.
TM3(1)6-2	Contributing Functions	Agricultural practices	Valued Functions	Contributing Functions (no fish habitat)	Limited Functions	Mitigation	SE2 (Low constraint) karst feature. Final recommendation may increase due to presence of karst feature. Low karst constraint indicates the potential for the feature to be removed (excavated and grouted) and by-passed by runoff.
TM3(1)6-3	Contributing Functions	Agricultural practices	Valued Functions	Contributing Functions (no fish habitat)	Limited	Mitigation	

HDF #	STEP 1		STEP 2	STEP 3	STEP 4	Management Recommendation (Figure 2)	Rationale
	Hydrology	Modifiers	Riparian	Fish Habitat	Terrestrial Habitat		
TM3(1)7	Contributing Functions	Agricultural practices	Limited Functions	Contributing Functions (no fish habitat)	Limited Functions	Mitigation	Dry defined channel in April (then plowed). Considered to have contributing hydrology although dry in April due to channel form.
TM3(1)7-1	Contributing Functions	Agricultural practices, road runoff	Limited Functions	Contributing Functions (no fish habitat)	Limited Functions	Mitigation	Dry defined channel in April (then plowed). Considered to have contributing hydrology although dry in April due to channel form.
TM3(1)7-1-1	Contributing Functions	Agricultural practices	Limited Functions	Contributing Functions (no fish habitat)	Limited Functions	Mitigation	
TM3(1)8	Contributing Functions	Agricultural practices	Limited Functions	Contributing Functions (no fish habitat)	Limited Functions	Mitigation	Dry defined channel in April (then plowed). Considered to have contributing hydrology although dry in April due to channel form.

GeoProcess conducted headwater drainage feature assessments for the reaches above in spring 2025. The GeoProcess survey reassessed the HDFs identified and assessed for the SWS. One survey round was completed, and no additional follow-up rounds were required, as no reaches were found to be flowing. The findings of the GeoProcess assessment confirmed the findings of the Matrix 2020 assessment. As a result, no changes to the Management Recommendations provided in Table 9 were made as a result of the 2025 work. Field data for the 2025 visit is provided in Appendix A.

4.4.7. Watercourse Characterization

In the SWS Report, watercourses are defined as "*permanently to intermittently flowing drainage features with defined beds and banks. They exhibit clear evidence of active channel process, including planform, profile, and material sorting, with evidence of a balance between erosion and deposition throughout the reach. They are often second-order or greater but may be first-order when verified by the practitioner(s)*".

Watercourses are currently identified as regulated features by the NPCA, and fish are typically found within these features. NPCA watercourse mapping (Contemporary Watercourse Mapping) was used to identify watercourses and HDFs as a scoping exercise, and field confirmation confirmed and/or updated feature identification and extents. In general, their drainage area exceeds 50 ha (Wood 2023a).

One watercourse exists within the northeast section of the Subject property, identified as TM3(1)3, as shown on Map 5 and was classified as a medium constraint (Table 10) in the SWS. Management recommendations from the SWS can be found in Table 11. The information presented in this section and in the tables below has been transcribed from the SWS Report.

Table 10. Watercourse Constraint Rankings (Wood 2023a)

Reach	Surface Water	Fluvial	Terrestrial	Fisheries	Karst/ Groundwater	Proposed Classification
TM3(1)3	Low	Medium	Medium	Low	Low	Medium

Table 11. Watercourse Management Strategy (Wood 2023a)

Watercourse Classification	Geomorphological Definition	Proposed Management Strategy
Blue Classification (Solid Blue Line on Map) – Medium Constraint	These reaches have well defined morphology (defined bed and banks, evidence of erosion/sedimentation, and sorted substrate). These reaches maintain geomorphic function and have potential for rehabilitation. In many cases, these reaches are presently exhibiting evidence of geomorphic instability or environmental degradation due to historic modifications and land use practices.	Watercourse to be protected with applicable meander belt and setbacks. Realignment may be acceptable when deemed appropriate for restoration and enhancement. Options: • Do nothing: Leave the corridors in their present condition and develop outside of their boundaries: Delineate an appropriate meander belt or erosion hazard corridor depending on valley classification. Determine additional regulatory setbacks as required. • Enhance existing conditions: maintain the present location of the corridor but enhance the existing conditions (e.g. bank stabilization, re-establish a meandering planform, connect channel to functioning floodplain). Natural channel design to be implemented for any adjustments.

- Re-locate and enhance existing conditions: many of the reaches within the study area have undergone extensive straightening and modification for agricultural drainage purposes. As such, they are not as sensitive to re-location and would benefit from enhancements such as the re-establishment of a meandering planform with functioning floodplain and development of a riffle-pool morphology (i.e. natural channel design). In the event that these reaches are re-located, the corridor width (meander belt width/hazard corridor) associated with each reach must, at a minimum, be maintained.

For reaches that have been straightened, appropriate surrogate reaches or empirical methods should be applied to determine the meander belt corridor. Natural channel design to be implemented for any realignment or adjustments.

4.5. Groundwater

The hydrogeologic study completed by Stantec found that the drainage feature associated with the rail line corridor was a groundwater recharge feature. The small wetland community along the northern limits was found to be a discharge site in the spring during high water table conditions and a recharge site during the summer, fall and winter when the groundwater table fell below the ground surface elevation. Volumetric contributions of groundwater discharge into the wetland are expected to be minimal due to the low permeability of the overburden soils of the Subject Property.

4.6. Tree Inventory

The Subject Property generally consists of agricultural lands with hedgerows of mature coniferous and deciduous tree species of various health conditions. A total of 315 trees were inventoried. Eighteen species were observed, of which none are considered SAR or of conservation concern. The assessment identified 49 trees that are recommended for retention and protection throughout the grading and construction process. The remaining 266 trees conflict with the proposed grading and construction plan and have been recommended for removal. Of the 266 trees identified for removal, 6 are dead trees. The full tree inventory and tree management plan completed by Stantec is appended to this report and can be found in Appendix E.

5. Species at Risk Screening

A list of SAR and SOCC with the potential to occur in the Study Area is presented in Table 12 below. The desktop background review identified thirty-six SAR and one Wildlife Concentration Area that have been previously documented as occurring in the atlas square or citizen science database associated with the Subject Property. Observations of SAR within these squares do not necessarily represent observations within the boundaries of the Subject Property.

Table 12. SAR Screening Results

Common Name	Scientific Name	S-Rank	SARO	SARA
Birds				
American Coot[4,1]	*Fulica americana*	S3B, S4N	NAR	NAR
Bald Eagle[7]	*Haliataeetus leucocephalus*	S4	SC	NAR
Barn Swallow[4,2]	*Hirundo rustica*	S4B	SC	THR
Bank Swallow[4]	*Riparia riparia*	S4B	THR	THR
Black Tern[4]	*Chlidonias niger*	S3B, S4M	SC	NAR
Blue-winged Teal[1]	*Spatula discors*	S3B, S4N	NAR	NAR
Bobolink[4,2,1]	*Dolichonyx oryzivorus*	S4B	THR	SC
Canada Warbler[4]	*Cardellina canadensis*	S5B	SC	THR
Caspian Tern[4]	*Hydroprogne caspia*	S3B, S5M	NAR	NAR
Chimney Swift[4,2]	*Chaetura pelagica*	S3B	THR	THR
Common Gallinule[1]	*Gallinula galeata*	S3B	N/A	N/A
Common Nighthawk[4]	*Chordeiles minor*	S4B	SC	SC
Eastern Meadowlark[2,1]	*Sturnella magna*	S4B, S3N	THR	THR
Eastern Wood-pewee[4,2,1]	*Contopus virens*	S4B	SC	SC
Golden-winged Warbler[4]	*Vermivora chrysoptera*	S3B	SC	THR
Grasshopper Sparrow[4]	*Ammodramus savannarum*	S4B	SC	SC
Horned Grebe[4]	*Podiceps auritus*	S1B, S3N, S4M	SC	SC
Lesser Yellowlegs[4]	*Tringa flavipes*	S3S4B, S5M	THR	THR
Northern Bobwhite[4]	*Colinus virginianus*	S1?	END	END
Peregrine Falcon[4]	*Falco peregrinus*	S4	SC	NAR
Red-headed Woodpecker[4,2,1]	*Melanerpes erythrocephalus*	S3	END	END
Red-necked Grebe[4]	*Podiceps grisegena*	S3	NAR	NAR
Red-necked Phalarope[4]	*Phalaropus lobatus*	S3B, S4M	SC	SC
Rusty Blackbird[4]	*Euphagus carolinus*	S4B, S3N	NAR	SC
Upland Sandpiper[4,1]	*Bartramia longicuada*	S2B	N/A	N/A
Virginia Rail[4]	*Rallus limicola*	S4, S5N	NAR	NAR
Wood Thrush[4,2,1]	*Hylocichla mustelina*	S4B	SC	THR
Wilson's Phalarope[4,1]	*Phalaropus tricolor*	S2B, S4M	N/A	N/A
Amphibians and Reptiles				

Common Name	Scientific Name	S-Rank	SARO	SARA
Eastern Milksnake[3,1]	*Lampropeltis triangulum*	S4	NAR	SC
Midland Painted Turtle[3,1]	*Chrysemys picta marginata*	S4	SC	SC
Insects				
Monarch[5]	*Danaus plexippus*	S2N, S4B	SC	END
Plants				
American Chestnut[7]	*Castanea dentata*	S1S2	END	END
Hairy Green Sedge[1]	*Carex hirsutella*	S3	N/A	N/A
Fish				
Grass Pickerel[6,1]	*Esox americanus*	S3	SC	SC
Mapleleaf Mussel[1]	*Quadrula quadrula*	S2	THR	SC
Lilliput[1]	*Toxolasma parvum*	S1	THR	END
Wildlife Concentration Area				
Mixed Wader Nesting Colony	*Colonial Wading Bird Colony*	SNR	N/A	N/A

Sources: [1] NHIC Database, [2] OBBA, [3] Ontario Reptile and Amphibian Atlas, [4] eBird Database, [5] Ontario Butterfly Atlas, [6] DFO Aquatic SAR Map, [7] iNaturalist

5.1. SAR Assessment

Based on the screening conducted by GeoProcess staff, in combination with vegetation communities and other environmental features observed and reported on during fieldwork completed by NRSI and GeoProcess staff, the following species were identified for further assessment:

5.1.1. Possibly Occurring

An assessment of the above list found that the Subject Property does not have the potential to provide habitat for any species listed in Table 12 (see Section 5.1.2 below).

5.1.2. Confirmed Presence

5.1.2.1. Barn Swallow

The barn swallow (*Hirundo rustica*) is now designated as Special Concern under the ESA as of January 25, 2023. It is found throughout southern Ontario and to the north as far as Hudson Bay. This species uses almost exclusively human-made structures to mount its cup-shaped nests on. Males show a glossy colouring of steel-blue on their back and breast band, while females have a pale underbelly and short tail feathers. The tail feathers form a distinctive deep fork with a line of white spots across the end. Since the mid-1980's the population has been in decline due to causes not well understood. Modernization of buildings, especially barns, and the use of agricultural pesticides are probable threats.

Barn swallows were observed by NRSI staff on the Subject Property during the fieldwork completed in 2020 and again by GeoProcess staff in 2025. They were seen and heard during breeding bird surveys and as incidental wildlife flying over the agricultural fields. There are no suitable structures located on-site that would be appropriate for nesting (i.e. open barns, bridges, culverts, and other built infrastructure); however, such structures do exist on surrounding properties. As a result, the barn swallows observed are likely using the site only for foraging, not nesting. Foraging habitat is not protected under the ESA.

6. Significant Wildlife Habitat (SWH) Screening

Significant Wildlife Habitat (SWH) is protected as per Section 2.1 of the Provincial Planning Statement, 2024. The Significant Wildlife Habitat Technical Guide (OMNRF, 2000) aids in land use planning by providing the identification, description, and prioritization of significant wildlife habitat in Ontario. The associated Ecoregion Criteria Schedules are used to further provide detailed criteria for assessing and confirming SWH within Ontario. This section will provide a screening in the form of a summary table, followed and an assessment of the potentially or confirmed occurring SWH.

Significant (and/or sensitive) Wildlife Habitat features and functions as described within the OMNRF Significant Wildlife Habitat Ecoregion Criteria Schedule for Region 7E (OMNRF, 2015) were reviewed and evaluated for the Study Area. The document groups wildlife habitat into five main categories:

- Seasonal concentration areas of animals
- Rare vegetation communities
- Specialized Habitat for Wildlife
- Habitat for species of conservation concern: Black Gum, Lizard's Tail, Slightly Hirsute Sedge, Eastern Wood-Pewee, Snapping Turtle, Monarch; and Terrestrial Crayfish
- Animal movement corridors

The full screening found in Appendix D consists of a review of the ELC codes and habitat criteria for candidate SWH. Any SWH on the Subject Property or adjacent lands was noted, and a rationale was provided. In the case of potential SWH, Confirmed Defining Criteria Studies were reviewed, and applicable mitigation measures (in summary form) were also provided in Column 5.

6.1. SWH Assessment

Based on a review of background information and accompanying field studies, the assessment found no candidate or confirmed SWH within the Subject Property. Maternity roost habitat was assessed for SAR bats through the snag survey conducted in October 2024. Although snags were identified throughout the Subject Property, the number, quality, and distribution of the snags present do not meet the minimum requirements to be considered SWH. No other candidate SWH was identified for the Subject Property.

7. Proposed Development

The Phase 1 Draft Plan, as prepared by Arcadis Professional Services (Canada) Inc., is presented on Map 6. Within the Study Area, the plan includes two main entrances to the development from Townline Road. Upon the completion of adjacent developments, the subdivision will also be accessible from Port Davidson Road and Shurie Road. The proposed development consists of single-detached and semi-detached homes, one

multi-family block (townhouses), Pipeline Easement, a Stormwater Management Facility (SWMF) block, Parkland/Trails, as well as a small portion of Parkland/Open Space (NP5), which was previously identified as a Recommended Restoration Area in the SWS. The proposed development also includes additional Parkland/Open Space that bisects the property east-west and contains a trail to be completed in the future by others. The total development area of the Phase 1 Draft Plan lands is 13.43 ha.

7.1. Natural Heritage System Constraints

7.1.1. Linkage

Linkages are connections between natural heritage features that provide movement opportunities for species between habitat patches that would otherwise be isolated. They enhance and maintain the viability of specific species populations by providing habitats for various life processes (e.g. breeding habitat, summer foraging habitat, etc.), preserving genetic variability, and allowing populations to recolonize areas where they are no longer found. Linkage function can be enhanced by locating compatible land uses adjacent to them, such as open space, passive recreational parkland, or naturalization and restoration areas.

As previously noted, a Linkage was mapped along the eastern border of the Subject Property, situated along the former railway. The proposed feature was highlighted in the SWS Phase 2 Report (Wood, 2023) and classified as a Secondary Linkage, 50 m in width and running the entire length of the Subject Property. The concept was to provide a direct connection between the Twenty Mile Creek and North Creek corridors while passing through woodlands and PSWs in between the two valleys.

In the Phase 1 Draft Plan, the Linkage has been revised to a width of 23 m to 25 m, which aligns with the existing width of the feature/former railway. The Linkage consists of parkland and trails, which can facilitate the movement of wildlife. Based on the location within the larger community, the linkage will require the crossing of Townline Road, which is a critical fragmentation of the Linkage. Roadways are known to limit the effectiveness of linkage functions, and their effect has a larger influence on the function of the linkage than reducing the width of the linkage from 50 m to 25 m. This is shown in models predicting the effectiveness of ecological corridor functions. Adrianensees et al. 2003, demonstrated through a landscape resistance model that the cost of a road crossing is much higher than the benefit of marginally increasing a corridor width, particularly when the change in crossing widths is small, such as the 25 m reduction proposed in this application. This is because the cost of an unmitigated road crossing is extremely high and acts as a limiting threshold within a linkage corridor. As a result, the wildlife and plant genetic movement potential across the landscape will effectively be the same in a 25 m corridor as in a 50 m corridor. Linkages at 25 m and 50 m are both entirely influenced by edge effects, with no core habitat available for large mammals. As such, larger mammals will likely show an equal avoidance of a corridor at 25 m or 50 m. As such, it has been recommended that the Secondary Linkage be relocated elsewhere in the subwatershed, where the linkage corridor would be less impacted by road crossings, thereby increasing the movement function for large mammals. The Linkage proposed in the Phase 1 Draft Plan supports the movement of smaller wildlife while also providing additional benefits to the community and achieving the goal of connecting the North Creek and Twenty Mile Creek corridors.

In addition to the north/south linkage, an opportunity to establish an east/west linkage is present along the pipeline easement. Planting of the easement with the native plants, like grasses and forbs, as tree and shrub planting are likely restricted within the easement, should be explored.

Stantec has developed a concept plan showing how the north/south and east/west linkage features are oriented within the development and proposed plantings. The physical factors of the corridor are important in facilitating the movement of wildlife. This includes the selection of planting species and their arrangement, and the inclusion of habitat structures. These physical properties provide food and shelter for wildlife, which is needed to encourage their use of the corridor. The landscape plan includes the planting of native species, complementing existing trees already present along the eastern property limit. Larger caliper stock will be used to immediately provide structure for wildlife usage.

In addition, a park and restoration area is proposed immediately south of the Subject Property. This area is directly connected to the north/south linkage and is connected to the woodland/PSW unit to the south through the continuation of the linkage south past the restoration area. Overall, the proposed linkages and restoration area are sufficient to facilitate the movement of wildlife through the development, providing an opportunity to connect the Twenty Mile Creek corridor to the North Creek corridor, as envisioned in the SWS.

7.2. Restoration Area

A restoration area has been proposed within Block 9, south of the Lockbridge Draft Plan. The restoration area was identified in the SWS to replace trees, which had been removed by the former landowner to complete ditching works to address flooding on Shurie Road. The tree removal was completed in consultation with the Township of West Lincoln, Region of Niagara and the NPCA, with the Township and NPCA providing permission to complete the work.

The restoration area shown within the Block 9 area is a “Recommended Restoration Area” to maintain the woodlot area that was removed between the Phase 1 and Phase 2 reports. Section 4.6.1.1 in the Phase 2 report states:

- *An additional Recommended Restoration Area was added in the south, to replace a Significant Woodland that was removed.*

The restoration area proposed in the SWS is considerably larger than the woodland area that had been present on the site. It appears that setbacks between 45 m to 55 m were added to the former woodland unit (Figure 8). From the image below, it can be seen that the former woodland did not fall within the Subject Property. It appears that the larger restoration area was identified within the SWS to achieve the Township’s Official Plan Policy of 30% NHS cover targets, going beyond the stated woodland replacement goal. A multi-use restoration area proposed for the Block 9 area has been sized to replace the former woodland. As such, the restoration area is not identified within the Subject Property.

Figure 8 Restoration Area (pink) from the SWS overlaid on an air photo base showing the extent of the former wooded area and the proposed Restoration Area

7.3. Stormwater Management

As outlined in the Functional Servicing Report (FSR) prepared by Stantec (2025), a stormwater management facility is proposed along the northern property limit (North SWMF). A South SWMF is also proposed beyond the Subject Property in the south of the Block Plan Area 9, which will service the remainder of the Block Plan Area beyond the Subject Property.

Minor flows are piped and will be directed via storm sewers ranging in size from 300 to 1200 mm in diameter that will ultimately be discharged to the proposed North SWMF. The system has been designed for the 5-year storm event. Major flows will be conveyed overland and follow a similar route to the minor piped flows. Discharging flows from the proposed North SWMF will outlet to the existing 900 mm diameter culvert under Townline Road, into the watercourse reach TM3(1)3. Outlet flows are eventually discharged to Twenty Mile Creek approximately 300 m north of Townline Road. All headwater drainage feature functions existing within the Subject Property will be replaced by the proposed North SWMF.

For lots backing onto Block 187 (the existing rail corridor and proposed Linkage), backyards will sheet drain into a swale, parallel to the trail that will direct drainage from rear yard catch basins. Flows will be directed via storm sewers under the proposed trail to the existing swale on the east side of the Subject Property, before being discharged north to the existing 600 mm diameter culvert at Townline Road (Figure 9 and Figure 10).

Figure 9. Upstream of the 600 mm culvert, facing south along the existing east swale.

Figure 10. View of the 600 mm culvert.

7.4. Grading

As per the FSR, grading plans for the Subject Property are based on requirements outlined in the Smithville MCP, as well as following the Municipal Road Design Standards. In general, grading across the Subject Property has been designed to follow existing drainage patterns where possible. The existing maximum elevation of the site remains generally unchanged to facilitate maintaining existing conditions and minimizing changes to the surface hydrology of the site. Grading will also be completed so that major overland flow is conveyed to the proposed SWM facilities and drainage swale. As previously noted, grading will require the removal of 266 trees. The remaining trees will be protected.

7.5. Watermain Servicing

The proposed development will connect to the existing watermain along Townline Road, at the proposed intersections at Street A and Street B. The existing watermain on Townline Road is a 150 mm diameter PVC pipe. Domestic water demand and fire flow requirements for the proposed development have been outlined in the FSR. A Water Distribution Analysis will be completed by the Township to identify the appropriate sizes of the proposed water mains within the development to adequately meet demands.

7.6. Sanitary Servicing

According to the FSR, the proposed sanitary sewer design for the Phase 1 Draft Plan consists of a network of 200 mm diameter sewers that discharge sanitary flows to the existing 200 mm sewer along Townline Road at the proposed intersection at Street A. Sanitary flows are then directed to the existing Smithville Sanitary Pumping Station (SPS).

8. Environmental Impact Assessment

Impacts on the natural heritage features in and adjacent to the Subject Property were considered in the impact analysis. Table 13 presents the natural heritage components that were considered in this assessment, the proposed activity associated with that component, potential short-term and long-term impacts, and recommended mitigation measures, as well as anticipated residual effects. Potential impacts were assessed using data collected in the field and through secondary sources, including an overlay of the proposed site plan.

Table 13. Impact Assessment Table

Feature and Function	Proposed Activity	Potential Impacts	Recommended Mitigation	Residual Effects
Short-Term Impacts				
Adjacent Natural Environment System	Grading, Servicing, and Development	Release of dust associated with construction activities.	Implement dust suppression measures during site grading when conditions are dry or strong winds are anticipated.	Impacts from dust on the surrounding landscape should be minimal. No residual effects are expected.
Breeding Birds	Site Clearing and Tree Removal	Impacts on nests and nesting birds.	Vegetation and tree clearing should not occur between April 1st and September 30th as per the Migratory Birds Convention Act (1994). If clearing occurs during the nesting season, a nest survey should be completed by a qualified bird biologist 48 hours before the proposed works to identify any active nests. Nests are not to be disturbed until the young have fledged or until the nest is deemed inactive. Education of contractors on wildlife encounters.	Implementation of applicable mitigation measures is expected to reduce or eliminate impacts on migratory and breeding birds during the construction period.
Surrounding Habitat	Grading, Servicing, and Development	Release of petroleum products or other contaminants into surrounding habitats.	To prevent contaminant runoff into the nearby natural heritage features, equipment maintenance and refuelling need to be controlled to prevent any discharge of petroleum products. Vehicular maintenance and refuelling should be conducted at least 30 m from any Regional Natural Environment System and watercourse. Construction material, excess material, construction debris, and empty containers should be stored in one location with proper containment and spill control measures in place.	No residual effects are expected if mitigation measures are followed.
Local and Migrating Wildlife	Grading, Servicing, and Development	Noise from construction works on local and migrating wildlife.	Limited measures can be employed, as a certain level of construction noise will occur. Limit construction activities at sunrise and sunset during the active spring breeding bird season.	Noise impacts to wildlife present may occur; however, as the Subject Property is located on the existing margin of the Community of Smithville, elevated noise levels are expected during daytime. As much of the wildlife found within the local landscape is tolerant of disturbances, they are anticipated to return to the area once construction activities end. No residual effects are expected.
Surrounding Habitat	Grading, Servicing, and Development	Soil compaction and rutting outside of the construction zone	Implementation of a construction maintenance plan and fencing to delineate the extent of the development footprint and ensure it is restricted.	Minimal residual effects anticipated.

Adjacent Natural Environment System	Grading, Servicing, and Development	Drainage and release of sediments to downstream watercourses within the existing drainage swale in the Linkage.	Implement silt fencing along the outer boundary of the VPZ of the Linkage to ensure that sediment does not migrate downstream to Twenty Mile Creek, its tributary TMC3(1)3, and the NES. Avoid construction during high-volume rain events or significant snow melts/thaws. Construction should resume once soils have stabilized to avoid the risk of erosion, soil compaction, or the potential for sediment release into nearby natural features/watercourses.	Inspection of the erosion and sediment controls (i.e. silt fences, sediment traps, outlets, vegetation, etc.) by a qualified environmental professional (CAN-CISEC designation or approved equivalent) with follow-up reports to the governing municipality should ensure proper implementation throughout the development. Fencing should be left in place until after construction works are complete and the site has sufficiently stabilized/re-vegetated. No residual effects are expected.
Long-Term Impacts				
Local and Migrating Wildlife	Development	Light pollution.	Lights directed downward will reduce the amount of ambient light issuing from the Subject Property. It is recommended that downward-casting lighting be used across the site, and lights are not directed towards any adjacent NES.	Due to the proximity of the proposed development to existing residential subdivisions, it is unlikely to create a measurable impact on ambient light pollution. If mitigation measures are implemented, the overall impact of light pollution on wildlife and insects can be reduced. The shielding and downward casting of lights and closing window coverings at night are good steps to reducing impacts. There will likely be some impact due to nighttime lighting, as not all outdoor lighting will be eliminated. The majority of impacts are anticipated at future phases of development beyond the Study Area boundary and influence of the Subject Property, specifically to the south, where the North Creek corridor and Significant Woodland exist.
Breeding Birds	Development	Bird strikes and deaths.	It is recommended that for homes backing onto the Linkage, windows facing the Linkage should include bird-friendly measures. Glass surfaces pose a threat to birds. Birds can see through glass and what is reflected on glass, but not the glass itself. There are several options to reduce bird strikes, depending on whether the treatments are before or after the glass has been installed. Pre-installation measures include frit and etched patterns, opaque and frosted glass, window muntins, exterior shutters, or UV-treated glass. Temporary solutions include installing deterrent measures on the outside of the windows, like	Installation of bird-friendly measures is recommended to be applied to the entire building. There is the potential for residual negative impact on the local and migrating avian population from bird strikes. For more information on bird strikes and bird-friendly building design, visit FLAP Canada's website.

			decals, ribbon, or tape. Lights can be turned off at night during migration windows in the spring and fall. As most songbirds migrate at night, bright lights can confuse and draw birds off course, resulting in additional bird strikes and delaying their migration. Making design choices with birds in mind before construction is the most effective way to reduce bird strikes.	
Adjacent Natural Environment System	Snow Storage	Salt run-off.	Snow should be stored internally in the development or removed to an external snow storage facility. Meltwater will be captured within the on-site SWM system.	Snow storage is not recommended adjacent to the Linkage or any adjacent NES. Through the capture of meltwater into the SWM collection system, there is a low likelihood that sodium-enriched water will be discharged into the surrounding natural environment and watercourse. Minimal residual effects are expected.
Surrounding Habitat	During Construction	Movement of invasive species to and from the site.	Machinery is a major vector for spreading terrestrial invasive species into new areas, as they may spread seeds or plant parts to other properties. Contractors are to follow the Clean Equipment Protocol for Industry (2013) as laid out by the Ontario Invasive Plants Council.	Minimal residual effects are expected while adhering to the recommended mitigation measures.
Surrounding Habitat and Proposed Linkage	Development	Removal of trees and vegetation supporting wildlife habitat.	Removal of trees is recommended to occur outside of the breeding bird window. If cutting is to occur between April and September, all trees to be cut are required to be screened for active nests by a qualified biologist. Active nests are not to be disturbed until the young have fledged the nest. Planting native species reflective of the local area and installing wildlife structures to account for habitat lost during development.	Long-term residual impacts on wildlife populations within the local area will likely be minor as the Study Area does not provide an abundance of suitable habitat, and the habitats supporting these species are well-represented within the surrounding landscape. Wildlife observations were limited to local, generalist species commonly found within the identified vegetation communities and the surrounding area. Long-term residual impacts on these species are not expected as a result of the proposed works. Additionally, it was determined that snag trees present within the Subject Property do not provide abundant suitable bat maternity roost habitat, and as such, their removal will not result in any long-term impacts to habitat.
Adjacent Natural Environment System and Proposed Linkage	Wildlife/Human Interactions	Encroachment, dumping and spread of invasive species.	Planting the linkage feature with native species reflective of the local area can help mitigate further abrupt changes to the surrounding NES of Smithville.	Residual effects of vegetation removal are anticipated to be minor due to their cultural influence. Opportunities for native planting will serve to improve the ecological functions of the Linkage adjacent to the

				proposed development and mitigate potential impacts from increased human presence. No residual impacts are anticipated.
Headwater Drainage Features	Grading, Servicing, and Development	Functions such as flow, sediment transport and organic matter can be lost to the downstream receiving system.	Maintain function to downstream features (e.g. sediment supply, water supply, seasonal wildlife habitat) by replicating its function through the stormwater management strategy, which can include elements such as enhanced lot level conveyance, such as bioswales, low-impact development measures, vegetated swales or constructed wetlands.	The SWMF has been designed to meet flow release targets to ensure that the stability of the receiving watercourse will be maintained. Flows will match pre- and post-peak flows and will not increase downstream flooding. A greater volume of water will be released into the downstream system. However, this will be released through the extended detention function of the SWM pond, resulting in a longer duration in baseflow conditions, which can provide an overall net benefit to its aquatic systems, particularly given it is an intermittently flowing system.

8.1. Direct Impact Assessment

Direct impacts are directly attributed to the proposed development activities, often occurring during the construction phase or associated with physically altering the landscape. Construction activities, including grading, servicing, and site development, can cause short-term direct impacts on the surrounding habitats and potential local and migrating wildlife.

The proposed development will result in the alteration of the Subject Property, which is primarily agricultural. As previously noted, vegetation and tree removal will be required, and it has been determined that the existing vegetation communities do not host any SAR or species of conservation concern and will be removed to support construction. The potential direct impacts identified for the proposed development include:

- Increase in dust levels during construction. Fine sediments and particulate matter could be distributed throughout the NHS through saltation (e.g. movement of sediment via wind).
- Transport of sediment to the adjacent NES and proposed Linkage, resulting in sedimentation of the downstream watercourse and impacts to aquatic habitats.
- Increase in noise levels impacting local and migrating wildlife. Noise can reduce the ability of wildlife to hear other individuals, which can be particularly problematic during breeding season.
- Edge impacts on the NES due to dumping, soil compaction, and removal or introduction of non-native vegetation.
- Vegetation and tree removal, consequently removing wildlife habitat.
- Change in surface runoff to the adjacent natural heritage features due to grade change and addition of impermeable surfaces.
- Contaminant runoff to the adjacent natural heritage features due to changes in land use.

Based on the existing disturbances in the area, the distance to surrounding natural heritage features, and the condition of the site, the proposed site development will not result in any measurable changes to the adjacent NES composition, structure, or function. The vegetation community associated with the proposed Linkage will be enhanced through its development as parkland and recreational trail, which should include native plantings.

8.2. Indirect Impact Assessment

Indirect impacts are those that occur as a secondary result of the proposed activity and not necessarily as a direct result of the activity. These are usually associated with effects such as population growth, density changes, or alterations/additions to road networks. One of the primary indirect impacts resulting from the proposed development will be the reduction of wildlife permeability across the landscape, as agricultural crop fields, in general, offer greater movement opportunities. While agricultural fields offer a more permeable landscape, they do not necessarily provide good movement opportunities for smaller wildlife species, particularly when fields have no crops and are bare soil, as the field provides no cover from predators. The loss of movement permeability results primarily from an increase in road networks and fencing. The inclusion of both a north/south greenway corridor and an east/west greenway corridor within the draft plan will help to mitigate this issue. Additionally, plantings and habitat structures included in these corridors will help facilitate the movement of wildlife year-round.

8.3. Cumulative Impact Assessment

Cumulative impacts are the cumulative changes to the environment due to past, present, and reasonably foreseeable future impacts. The Subject Property and surrounding landscape have experienced ongoing disturbance from historical and current land use, which has generally consisted of traditional and intensive agricultural practices. This has resulted in the loss of most natural features and communities from the landscape over time. The proposed development is also occurring within an area that is in the process of transitioning to an urban landscape that will continue to undergo anthropogenic stressors as the Community of Smithville continues to expand. These stressors have likely already changed the form and function of the local area. Such changes include alterations to ambient noise and light conditions, shifts in insect communities, shifts towards urban-tolerant wildlife, and changes in both surface and groundwater flow and volumes. The proposed development, by its very nature, will result in a continuation of the shift towards a natural area that supports species most adapted to living with anthropogenic disturbances and stressors. Recognizing the role that urbanization has and will continue to have on adjacent natural areas, the proposed development has included mitigation measures to reduce these cumulative impacts.

The existing condition of the adjacent NES, or proposed Linkage, is generally limited due to its former use as a rail corridor. Fencing along Townline Road also creates a barrier which is not conducive to the movement of large terrestrial wildlife. Moreover, the headwater drainage features and tributaries of Twenty Mile Creek through the Study Area were found not to provide high-quality aquatic habitat or vegetation diversity. By reinforcing the existing corridor features through the planting of native plants, and by formalizing an east/west corridor along the pipeline easement, the movement of wildlife will continue to be facilitated through the development. The inclusion of a restoration area to the south of the draft plan area will increase native plantings in the Block 9 area.

8.4. Impact Summary

The proposed development will result in the alteration of the majority of the property due to the removal of all existing vegetation communities within the Subject Property. The natural heritage features found within the Subject Property were limited and comprised of culturally influenced communities. The small Manitoba maple woodland feature is associated with former structures, likely an old farmhouse and other farm-related structures. The proliferation of Manitoba maple is likely reflective of the trees that were present around the structures and expanded once the area was no longer being maintained. As the wooded area is comprised of one early successional species, it does not represent a diverse and high-quality wildlife habitat and does not support any significant species, SAR or their habitats. The ecological functions that this feature currently provides will be replaced by planting a diverse range of native species within the Linkage feature, which will compensate for the natural cover currently provided within the woodland. The plantings within the Linkage will increase the biodiversity of the Subject Property and provide a more meaningful connection between the natural features north and south of the Subject Property. Tree removal details are further elaborated on in Appendix E.

Although HDFs are currently present within the Subject Property and will be removed through the development of the site, their function to the downstream receiving system will be maintained. The HDFs on the property all flowed to the same watercourse/outlet point. The proposed SWM strategy captures all flows from the site and outlets to the same location as the HDFs, maintaining the same pre-development flow pattern. Flows from the site will continue to contribute to the downstream receiving systems as they currently do. However, the overall water quality will likely be improved as both quality and quantity controls will be

provided, which are not present in the current condition. An additional volume of water will be generated from the property, which will be released, meeting the targets established in SWS to protect the downstream watercourse from flooding and erosion hazards. This extra volume of water will likely increase the duration of baseflow within the system, which would provide a net benefit to the aquatic ecology of the watercourse.

While six snags were identified, they are spread across the property and do not represent high-quality bat maternity roosting habitats. A snag survey of the Manitoba maple wooded area did not identify snags within this feature. Overall, the assessment of bat maternity roosting habitat potential for the Subject Property found limited potential, and as a result, there is limited concern that bat maternity roosting habitat will be impacted by the proposed development.

The proposed mitigation measures of providing naturalized north/south and east/west linkage corridors through the development will help to facilitate the continual movement of wildlife across the landscape. Due to existing disturbances in the area, existing modification of the surrounding landscape through agriculture and residential development, and the condition of the site, it is unlikely the proposed development will result in any measurable changes to the immediate community composition or nearby ecological systems.

9. Mitigation Measures

The following mitigation measures are recommended to avoid and minimize impacts. The measures have two distinct intended outcomes: mitigation to reduce the impact on the natural heritage system and mitigation to reduce the impact of active construction.

9.1. Natural Heritage System Measures

Before machinery is active on site, a visual search of the work area should be conducted before work commences each day, particularly for the period when most wildlife is active (generally April 1st to October 31st). Visual inspections will target snakes, turtles, and other ground-dwelling wildlife such as small mammals. Visual searches should also include inspecting machinery and equipment left in the work area overnight before starting equipment to ensure that wildlife is safely out of the work area.

Other natural heritage system measures include:

- Minimize outdoor lighting and direct it down and away from natural areas.
- Inspection by a qualified person(s) to conduct regular monitoring of all sediment and erosion measures implemented to ensure they are in working order. Any deficiencies observed are to be recorded and immediately reported to the site contractor.
- Architectural considerations to minimize bird strikes, which could include window glazing, frosting or etching, UV-treated glass, or exterior window coverings (i.e. shutters or muntins).
- Provide native plantings reflective of the local area within the proposed Linkage. Vegetation removed within the corridor over time for agriculture should be considered while also enhancing the vegetation community. See Section 10 for enhancement opportunities.

Construction Measures

General construction-related mitigation measures include the following:

- Clearing of vegetation within the Subject Property as part of site preparation should be conducted in late summer or winter months (September to March) so as not to coincide with the breeding bird window (April 1st to September 30th) as well as the active bat window, which follows the same timing. If clearing is to proceed within the breeding bird window, the Subject Property should be screened by a qualified bird biologist to determine if any migratory songbirds are nesting within the work zone. Any identified nests are to be protected until it is confirmed that the young have fledged from the nest.
- Implementation of the erosion and sediment control plan (ESC) is recommended to prevent releases of sediment into the adjacent natural areas. The ESC plan and monitoring should be reviewed and carried out by a qualified environmental professional (i.e. CAN-CISEC certification). Any deficiencies observed are to be recorded and immediately reported to the site contractor. ESC measures should not be removed until the site is deemed sufficiently stabilized by a qualified environmental professional.
- The limits of construction are to be delineated prior to the arrival of heavy equipment on site.
- Heavy machinery on site should be washed prior to entering the Subject Property to prevent the spread of invasive species.
- Implementation of dust control measures is recommended to reduce dust impacts on the adjacent lands.
- A construction work plan should designate specific locations for stockpiling of soils and other materials to avoid impacts to the Linkage.
- Topsoil removed during stripping is recommended to be stockpiled for reapplication post-construction.

9.1.1. Erosion and Sedimentation Control Plan

The following approach to erosion and sediment control on-site has been prepared to minimize the potential impacts associated with on-site erosion and/or off-site transport of sediment to downstream areas. Prior to any grading or servicing works commencing on site, erosion and sedimentation control measures shall be implemented as detailed on the Pre-grading, Erosion and Sedimentation Control Plans (prepared during detail design). The erosion and sedimentation controls will include the following items:

- Steep slopes (>3:1) shall have erosion blankets.
- Light and/or heavy-duty silt fencing will be erected on all site boundaries where there is potential for runoff to be discharged offsite, to protect adjacent downstream lands from migration of sediment in overland flow. The location of this fencing will be adjacent to the limit of grading. Silt fence attached to paige wire fencing will be installed periodically throughout the Site adjacent to sensitive areas. Silt fencing should be erected before grading begins to protect adjacent and downstream areas from migration of sediment in overland flow.
- Following completion of construction and site stabilization, all erosion and sediment control measures and accumulated sediment are to be removed. The erosion control measures shall be

maintained in good repair during the entire construction period and shall only be removed as contributing drainage areas are restored and stabilized. In addition, the condition of erosion control works, their overall performance, and any repairs, replacement, or modifications to the installed item shall be noted in the Monitoring Reports submitted to the NPCA and the Township. The Monitoring Reports should be submitted bi-monthly (quarterly during periods of inactivity or house construction) and should be based on inspection completed bi-weekly or after any significant rainfall events (>13 mm), whichever is more frequent.

10. Enhancement Opportunities

As per Section 5.1.2.2 of the SWS Phase 2 Report, the proposed Linkage identified on the eastern border of the Subject Property is identified as an area for restoration action:

"Linkages, buffers, and Restoration Areas are to be naturalized. Naturalization can occur through active restoration of these areas by planting and seeding of native species."

Ecological enhancements would increase the usefulness of the corridor for species. Recommended enhancement measures will include the following:

- Planting of native species reflective of the local area within the confines of the proposed Linkage area:
    - Native seed mixes will be used, and plantings will range in size (e.g. calliper, stock, whips, plugs) to create a range of habitats.
- Providing wildlife habitat features within the proposed Linkage area, such as:
    - Raptor poles to provide viewing/hunting perches for birds of prey.
    - Bat boxes to replicate bat roosting trees lost from development processes.
    - Pollinator boxes for solitary bee and pollinator species.
    - Terrestrial log tangles to provide habitat for small mammals.
    - Rock/brush piles to provide cool spaces for amphibians and other small animals.
    - Invasive species management and removal (if deemed necessary).

The natural heritage features within the Subject Property contribute to the greater Smithville NES and must be managed and maintained following enhancement to ensure long-term sustainability. This includes enhancement, stewardship, and management opportunities such as the following:

- Following the Smithville Block 9 Concept Plan, a "Future Active Transportation Trail" (a formal trail) within the proposed Linkage would provide recreational opportunities and discourage footpaths and dumping.
- Fencing along the rear yards facing the proposed Linkage is recommended to discourage informal access.

- Providing nature interpretive signs along formal trails for educational purposes and to foster a sense of respect and belonging with the local environment.

11. Policy Conformity

The Phase 1 Draft Plan conforms with the policies of the Niagara Region Official Plan and the Official Plan of the Township of West Lincoln as it relates to Natural Heritage Systems. Specifically, it ensures that development-related activities before, during and after do not impact the Linkage within the Subject Property, the nearby Natural Heritage Systems that the linkage connects, and the surrounding landscape. Relevant policies, conformity, and rationale can be found in Table 14.

Table 14. Policy Conformity

Policy Reference	Policy	Rationale
Endangered Species Act (2007)	Clause 10(1)(a): *"No person shall damage or destroy the habitat of a species that is listed on the Species at Risk in Ontario list as an endangered or threatened species."*	No species at risk or species at risk habitat was found within the Subject Property. The observed barn swallows were considered fly-overs.
Niagara Region Official Plan (2022)	Section 3.1.17: *"…opportunities for additional, ecologically appropriate linkages…"* not currently included in Schedule C2 to be screened for when a Subwatershed Study (SWS) is being completed in support of a secondary plan.	The SWS for the Community of Smithville identified an opportunity for an ecologically appropriate Linkage feature along the eastern border of the Subject Property. It is ecologically appropriate because it connects two larger components of the Smithville NHS, specifically the Twenty Mile Creek and North Creek Corridors. A Linkage is provided in the Draft Plan. Revisions to the size of the Linkage have been proposed under the Phase 1 Draft Plan due to existing conditions and observed limitations in the suitability of the location to provide an effective movement corridor for large wildlife. As such, the Linkage has been maintained at its existing footprint and proposed for enhancement with the addition of a recreational pedestrian trail.
Niagara Region Official Plan (2022)	Section 3.1.17.3 point c): "*describes the ecological functions the linkage is intended to provide and identifies how these ecological functions can be maintained or enhanced within a development proposal".*	The Linkage will provide connectivity between the Twenty Mile Creek and North Creek corridors for small wildlife. Vegetation communities within the Linkage will be enhanced with native plantings, which will also aim to offset the tree removal required for the development.

Policy Reference	Policy	Rationale
Niagara Region Official Plan (2022)	Section 3.1.20, objective i): *"establish or enhance linkages or connectivity between key Natural Heritage Features, and/or Natural Heritage Features and areas".*	The proposed Linkage feature will run to the Significant Woodland and a PSW to the south and connect larger Natural Areas surrounding Twenty Mile Creek and North Creek, thus contributing to the larger NHS of Smithville. As previously noted, the Linkage is located in an urban area without suitable wildlife crossing options for large wildlife that would prevent human/wildlife interactions. As such, the form and function of the Linkage have been designed to maintain the connection between natural heritage features, support the movement of small wildlife, and also provide recreational benefits to the larger community.
Niagara Region Official Plan (2022)	Section 3.1.10.1 *"development or site alteration shall not be permitted unless it can demonstrate that it will not have negative impacts on: a) the natural hydrologic characteristics of watercourses such as base flow, form and function and headwater drainage areas."*	The SWM strategy proposed meets release targets and will not impact the tributary to Twenty Mile Creek between Townline Road and the northern border of the Subject Property. Additionally, the Phase 1 Draft Plan will replicate the hydrologic functions of the HDFs for the Subject Property. The stormpond will discharge water to the same watercourse as the pre-development HDFs did. Overall, the development will not alter the surface flow of the site and where that water is directed.
Niagara Region Official Plan (2022)	NROP defines "significant surface water contribution areas" as *"headwater drainage features classified as protection, conservation and mitigation"*. Classifying and recommending management for such areas must be done in accordance with the 'The Evaluation, Classification and Management of Headwater Drainage Features Guideline', prepared by the Toronto and Region Conservation Authority and Credit Valley Conservation (2014)	The HDFs within the Subject Property are classified as mitigation in the SWS Phase 2 Report (Wood 2023). The HDF assessment followed the appropriate TRCA and CVC (2014) protocol. All subsequent actions and plans presented in this EIS account for the volume, flow and contribution of water these HDFs have to the greater hydrological landscape of Smithville. Flow patterns downstream of the subject property will be maintained and even enhanced due to the potential to increase base-flow conditions from their pre-development condition.

Policy Reference	Policy	Rationale
The Official Plan of the Township of West Lincoln (2022)	Objective l) under section 3.6.3. of the Official Plan is *"to promote trails and corridors and linkages across the Township"*, and Section 10.3. states that *"the Township Council supports and encourages conservation and restoration of natural vegetation and wildlife throughout the rural and agricultural areas..."*.	The Subject Property contains a natural area along the former railway corridor that acts as a natural Linkage between larger Natural Heritage Features within the NHS of Smithville. The proposed development will recognize these lands as a Linkage and work to enhance the feature through naturalization efforts.
The Official Plan of the Township of West Lincoln (2022)	*"maintain, restore and improve the linkages among surface water features, groundwater features, hydrologic functions and natural heritage features and areas, and their ecological functions*"	The proposed Linkage area will improve connectivity among other Natural Heritage Features in the surrounding landscape.
The Official Plan of the Township of West Lincoln (2022)	*3.1.17.2. Only linkages which have been mapped as part of the natural environment system are shown on Schedule C2. Opportunities for additional, ecologically appropriate, linkages shall be screened for when a subwatershed study is being completed in support of a secondary plan.* And *3.1.17.3 When a subwatershed study is being undertaken, or when development or site alteration is proposed in, or within 30 metres of a linkage shown on Schedule C2, an evaluation shall be completed.*	The proposed Linkage within the Subject Property was identified during the SWS. The proposed Linkage is not shown on Schedule C2 but was identified during the SWS, and an evaluation of the community was undertaken by NRSI in 2020. Vegetation communities were confirmed by GeoProcess in October 2024. The Phase 1 Draft Plan has included a proposed Linkage that has been designed according to existing conditions, form, and function.
The Official Plan of the Township of West Lincoln (2022)	Section 10.3.2. Policies state that *"development plans shall integrate natural features and natural vegetation, including the planting of native species. A landscape plan shall be provided for any commercial, industrial/employment, institutional or multiple-residential development."*.	The Linkage will be planted with native species that are reflective of the local area. A preliminary landscape plan has been developed, which shows native plantings within the corridor.
Niagara Peninsula Conservation Authority	Ontario Regulation 41/24: Conservation Authorities are to *"prohibit, regulate or provide permission for straightening, changing, diverting or interfering in any way with the existing channel of a river, creek, stream, watercourse or changing or interfering with a wetland"*.	The portion of the Twenty Mile Creek tributary located on the Subject Property that has a defined bed and bank is being maintained in its existing condition. The development of the North SWMF will be completed following appropriate NPCA permitting and authorization requirements.

The proposed development does not affect the NHS identified in Schedules E-10 and E-12 of the Township of West Lincoln Official Plan and conforms to policies outlined in the NROP, as groundwater, surface water, and other hydrological functions are included in the NES and accounted for in the development plans. The tributary of Twenty Mile Creek, regulated under Ontario Regulation 12/24 and administered by the NPCA will not be directly impacted by development activities, and protection measures during construction are outlined in Section 9 above.

12. Closing

This EIS is intended to review the proposed development as it relates to the surrounding natural heritage system. Work completed included a policy review, biophysical surveys to document the existing ecological conditions, consultation with regulatory agencies, and a review of the proposed Phase 1 Draft Plan. From a natural heritage perspective, the proposed plan meets the requirements of the NROP and Official Plan of The Township of West Lincoln and with the implementation of the standard mitigation measures described, can proceed without negative impacts on the local natural heritage system.

The EIS found that the proposed development will not impact Species at Risk habitat, Significant Woodlands, Significant Wetlands, or SWH as defined by the Province. A small cultural woodland will be removed along with the hedgerow features. Plantings of native species within the Linkage to be established along the eastern property boundary will compensate for the treed cover removed in these features. The north/south and east/west linkage corridors will provide the wildlife permeability through the development, maintaining wildlife movement across the properties. The SWM strategy will replicate the headwater drainage feature functions, with discharge from the pond to the downstream receiving watercourse meeting release targets set in the SWS. Overall, the EIS concludes that the development will not have a negative impact on surrounding natural heritage features or their functions and, through the establishment of a vegetated Linkage, has the opportunity to provide a net gain to the area.

13. References

Adriaensen, F., Chardon, J.P., De Blust, G., Swinnen, E., Villalba, S., Gulinck, h., Matthysen, E. 2003. The application of 'least-cost' modelling as a functional landscape model. Landscape and Urban Planning 64 pg. 233-247.

Alan Macnaughton, Ross Layberry, Rick Cavasin, Bev Edwards and Colin Jones. Ontario Butterfly Atlas.

Cadman, M.D., D.A. Sutherland, G.G. Beck, D. Lepage, and A.R. Couturier (eds). 2007. Atlas of the Breeding Birds of Ontario 2001- 2005. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto. 706 pp.

Chapman, L.J. and Putnam, D.F. 1984. The Physiography of Southern Ontario; Ontario Geological Survey, Special Volume 2, 270p.

David Kaposi, Alan Macnaughton and Bev Edwards. Ontario Moth Atlas.

Fisheries and Oceans Canada. Available from https://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html.

Government of Canada. 2002. Species at Risk Act, S.C. 2002, c. 29. Department of Justice, Ottawa. 116 pp. Available from: https://laws.justice.gc.ca/eng/acts/s-15.3/

iNaturalist. Available from https://www.inaturalist.org.

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

Natural Heritage Information Centre (NHIC). NHIC website. Ontario Ministry of Natural Resources.

Ontario. Ministry of Municipal Affairs and Housing. 2024. Provincial Planning Statement, 2024. https://www.ontario.ca/files/2024-10/mmah-provincial-planning-statement-en-2024-10-23.pdf

Ontario Breeding Bird Atlas (OBBA). 2001. Guide for Participants. Bird Studies Canada.

Ontario Ministry of Natural Resources (OMNR). 2000. Significant Wildlife Habitat Technical Guide. Fish and Wildlife Branch, Wildlife Section. Science Development and Transfer Branch, Southcentral Sciences Section.

OMNR. 2009a. Draft Significant Wildlife Habitat Ecoregion Criteria Schedules. Addendum to Significant Wildlife Habitat Technical Guide.

Ontario Ministry of Natural Resources and Forestry (OMNRF). 2009. Significant Wildlife Habitat Ecoregion 7E Criterion Schedule. Addendum to Significant Wildlife Habitat Technical Guide.

OMNRF. 2013. Southern Ontario Vascular Plant Species List 3rd Edition. Southern Science & Information Section.

Township of West Lincoln. 2023. Smithville Community Master Plan. https://plansmithville.ca/wp-content/uploads/2023/04/Smithville-MCP_Integrated-MCEA-Report.pdf

Stantec Consulting Limited (Stantec). 2025. Smithville Phase 3A, Block Plan Area 9, Phase 1 Draft Plan, Smithville, Ontario, Functional Servicing Report (Draft).

Wood Environment & Infrastructure Solutions (Wood). 2023a. Subwatershed Study Phase 1: Characterization and Integration. Smithville Subwatershed Study and Stormwater Management Plan. Township of West Lincoln (Smithville).

Wood. 2023b. Subwatershed Study – Phase 2: Impact Assessment. Smithville Subwatershed Study and Stormwater Management Plan.

Wood. 2023c. Subwatershed Study Phase 3: Management, Implementation, and Monitoring Plan (Draft). Smithville Subwatershed Study and Stormwater Management Plan.

Wood. 2023d. Appendix B: Smithville Subwatershed Study and Stormwater Management Plan Reports.

Environmental Impact Study
Smithville Block Plan Area 9, West Lincoln

Prepared for Lockbridge Developments

October 14, 2025

Prepared by:

Lauren Barnett
Field Ecologist

Reviewed by:

Ken Glasbergen
Principal, Senior Ecologist

Disclaimer

We certify that the services performed by GeoProcess Research Associates were conducted in a manner consistent with the level of care, skill and diligence to be reasonably exercised by members of the engineering and science professions.

Information obtained during the site investigations or received from third parties does not exhaustively cover all possible environmental conditions or circumstances that may exist in the study area. If a service is not expressly indicated, it should not be assumed that it was provided. Any discussion of the environmental conditions is based upon information provided and available at the time the conclusions were formulated.

This report was prepared exclusively for Lockbridge Developments by GeoProcess Research Associates. The report may not be relied upon by any other person or entity without our written consent and that of Lockbridge Developments. Any uses of this report or its contents by a third party, or any reliance on decisions made based on it, are the sole responsibility of that party. GeoProcess Research Associates accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this report.

Project Number P2024-922

Maps

GeoProcess RESEARCH ASSOCIATES

CREATED BY: PA
CHECKED BY: KG
PROJECT NO.: P2024-922
DATE: Oct 09, 2025

0 200 400 m

NAD83 / UTM zone 17N (EPSG:26917)

Notes:
[1] Watercourse layer: Ontario Hydro Network
[2] Road layer: Ontario Road Network
[3] Base imagery: Google
[4] Contains information licensed under the Open Government Licence - Ontario

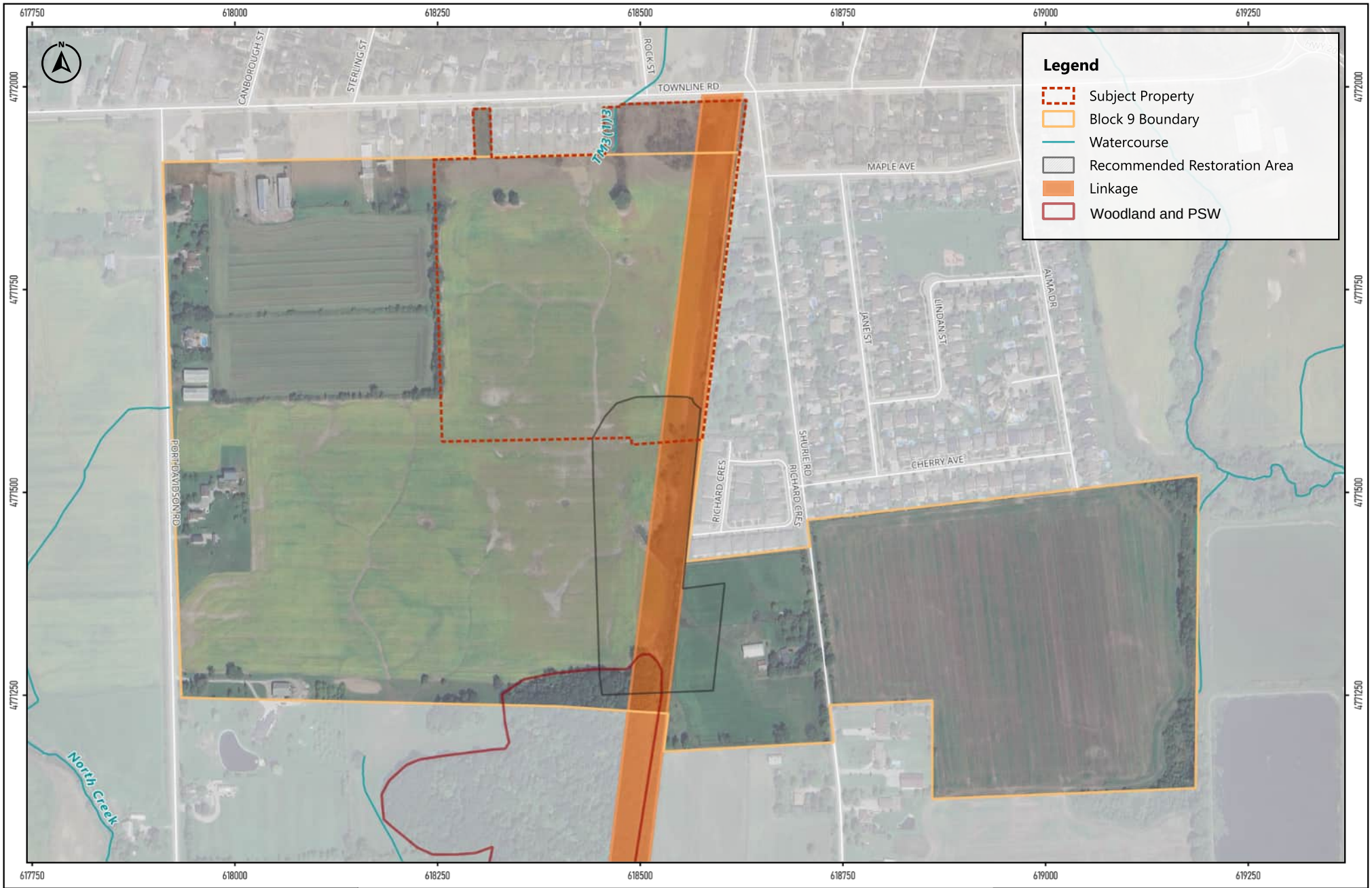
Map #1.

Key Map

Block 9, Smithville Phase 1

Lockbridge Developments

G:\Shared drives\Projects-2024\P2024-922 Block 9 EIS, Smithville\GIS\Project\EIS Map_2025-10-09_PA .qgz



GeoProcess RESEARCH ASSOCIATES

CREATED BY: PA
CHECKED BY: KG
PROJECT NO.: P2024-922
DATE: Oct 09, 2025

0 200 400 m

NAD83 / UTM zone 17N (EPSG:26917)

Notes:
[1] Watercourse layer: Ontario Hydro Network
[2] Road layer: Ontario Road Network
[3] Base imagery: Google
[4] Contains information licensed under the Open Government Licence - Ontario

Map #2.

Natural Heritage System

Block 9, Smithville Phase 1

Lockbridge Developments

G:\Shared drives\Projects-2024\P2024-922 Block 9 EIS, Smithville\GIS\Project\EIS Map_2025-10-09_PA .qgz

GeoProcess RESEARCH ASSOCIATES

CREATED BY: PA
CHECKED BY: KG
PROJECT NO.: P2024-922
DATE: Oct 09, 2025

0 100 200 m

NAD83 / UTM zone 17N (EPSG:26917)

Notes:
[1] Watercourse layer: Ontario Hydro Network
[2] Road layer: Ontario Road Network
[3] Base imagery: Google
[4] Contains information licensed under the Open Government Licence - Ontario

Map #3.

Terrestrial Survey Locations

Block 9, Smithville Phase 1

Lockbridge Developments

G:\Shared drives\Projects-2024\P2024-922 Block 9 EIS, Smithville\GIS\Project\EIS Map_2025-10-09_PA .qgz

ELC Code	Description
H	Hedgerow
CUT1-4	Gray Dogwood Deciduous Shrub Thicket
CUW	Coniferous Woodland
FOD7	Fresh-Moist Lowland Deciduous Forest
FOD9	Fresh-Moist Oak-Maple-Hickory Deciduous Forest
MAM	Meadow Marsh
MAMM1-3	Reed-canary Grass Graminoid Mineral Meadow Marsh

GeoProcess RESEARCH ASSOCIATES

CREATED BY: PA
CHECKED BY: KG
PROJECT NO.: P2024-922
DATE: Oct 09, 2025

0 100 200 m

NAD83 / UTM zone 17N (EPSG:26917)

Notes:
[1] Watercourse layer: Ontario Hydro Network
[2] Road layer: Ontario Road Network
[3] Base imagery: Google
[4] Contains information licensed under the Open Government Licence - Ontario

Map #4.

Ecological Land Classification

Block 9, Smithville Phase 1

Lockbridge Developments

G:\Shared drives\Projects-2024\P2024-922 Block 9 EIS, Smithville\GIS\Project\EIS Map_2025-10-09_PA .qgz

GeoProcess RESEARCH ASSOCIATES

CREATED BY: PA
CHECKED BY: KG
PROJECT NO.: P2024-922
DATE: Oct 09, 2025

0 100 200 m

NAD83 / UTM zone 17N (EPSG:26917)

Notes:
[1] Watercourse layer: Ontario Hydro Network
[2] Road layer: Ontario Road Network
[3] Base imagery: Google
[4] Contains information licensed under the Open Government Licence - Ontario

Map #5.

Headwater Drainage Features

Block 9, Smithville Phase 1

Lockbridge Developments

G:\Shared drives\Projects-2024\P2024-922 Block 9 EIS, Smithville\GIS\Project\EIS Map_2025-10-09_PA .qgz

GeoProcess RESEARCH ASSOCIATES

CREATED BY: PA
CHECKED BY: KG
PROJECT NO.: P2024-922
DATE: Oct 09, 2025

0 100 200 m

NAD83 / UTM zone 17N (EPSG:26917)

Notes:
[1] Watercourse layer: Ontario Hydro Network
[2] Road layer: Ontario Road Network
[3] Base imagery: Google
[4] Contains information licensed under the Open Government Licence - Ontario

Map #6.

Proposed Development

Block 9, Smithville Phase 1

Lockbridge Developments

G:\Shared drives\Projects-2024\P2024-922 Block 9 EIS, Smithville\GIS\Project\EIS Map_2025-10-09_PA .qgz

Appendix A

Headwater Drainage Features and Watercourses

Figure A-1: Appendix G-3, Table 1: Headwater Drainage Feature Assessment (Wood, 2022a)

Appendix G-3
Table 1 – Headwater Drainage Feature Assessment
All features subject to management strategies in Table 1, Appendix G-1

HDF ID	Outside of Study Area	Assessed	Hydrology	Riparian	Fish Habitat	Terrestrial	HDF Management	Final Recommendation	Rationale / Notes
TM1(2)5		Y	Contributing	Important	Contributing	Limited	Conservation		Wetland vegetation.
TM1(2)5-1		L	Limited	Limited	Contributing	Limited	No Management Required		
TM1(2)6		Y	Contributing	Important	Contributing	Limited	Conservation		Wetland vegetation.
TM1(2)6-1		L	Limited	Valued	Contributing	Limited	No Management Required		
TM1(2)7		Y	Contributing	Limited	Contributing	Limited	Mitigation		
TM1(2)7-1		Y							
TM1(2)8		N							
TM1(2)8-1	Y	N							
TM3(1)4		Y	Contributing	Contributing	Contributing	Limited	Mitigation		Linkage to wetland upstream
TM3(1)5		Y	Contributing	Valued	Contributing	Limited	Mitigation		Linkage to wetland upstream
TM3(1)6		Y	Contributing	Limited	Contributing	Limited	Mitigation		
TM3(1)6-1		Y	Contributing	Limited	Contributing	Limited	Mitigation		
TM3(1)6-1-1		Y	Contributing	Limited	Contributing	Limited	Mitigation		
TM3(1)6-1-2		Y	Contributing	Limited	Contributing	Limited	Mitigation		Dry defined channel in April (then plowed). Considered to have contributing hydrology although dry in April due to channel form, and anecdotal evidence from residents of recent high flows prior to April site visit.
TM3(1)6-2		Y	Contributing	Valued	Contributing	Limited	Mitigation		SE2 (Low constraint) karst feature. Final recommendation

Appendix G-3

Table 1 – Headwater Drainage Feature Assessment

All features subject to management strategies in Table 1, Appendix G-1

HDF ID	Outside of Study Area	Assessed	Hydrology	Riparian	Fish Habitat	Terrestrial	HDF Management	Final Recommendation	Rationale / Notes
									may increase due to presence of karst feature. Low karst constraint indicates the potential for the feature to be removed (excavated and grouted) and by-passed by runoff.
TM3(1)6-3		Y	Contributing	Valued	Contributing	Limited	Mitigation		
TM3(1)6-4		L	Limited	Valued	Contributing	Limited	No Management Required		
TM3(1)7		Y	Contributing	Limited	Contributing	Limited	Mitigation		Dry defined channel in April (then plowed). Considered to have contributing hydrology although dry in April due to channel form.
TM3(1)7-1		Y	Contributing	Limited	Contributing	Limited	Mitigation		Dry defined channel in April (then plowed). Considered to have contributing hydrology although dry in April due to channel form.
TM3(1)7-1-1		Y	Contributing	Limited	Contributing	Limited	Mitigation		
TM3(1)8		Y	Contributing	Limited	Contributing	Limited	Mitigation		Dry defined channel in April (then plowed). Considered to have contributing hydrology although dry in April due to channel form.
TM3(1)9		L	Limited	Limited	Contributing	Limited	No Management Required		
TM4(1)1	Y	N	NA	NA	NA	NA	NA		
TM4(1)2-1	Y	N	NA	NA	NA	NA	NA		

Figure A-2: Appendix G-2, Table 2: Watercourse Constraint Rankings (Wood, 2022a)

Appendix G-2
Table 1 – Watercourse Constraint Rankings
All features subject to management strategies in Table 1, Appendix G-1

Reach	Outside Study Area	Surface Water	Fluvial	Terrestrial	Fisheries	Karst and Groundwater	Proposed Watercourse Classification	Comments
SC1(4)	Y	Medium	Medium	Low	Medium	Low	Medium	Fish present in spring
SC1(5)	Y	Medium	Medium	Low	Medium	Low	Medium	Fish may be present in spring based on connection to SC1(4)
TM1	Y	High	High	High	High	High	High	Fish present year-round, including potential for Grass Pickerel (Special Concern)
TM2		High	High	High	High	High	High	Fish present year-round, including potential for Grass Pickerel (Special Concern) Opportunity to enhance the riparian zone where it is narrow or absent
TM3		High	High	High	High	High	High	Fish present year-round, including potential for Grass Pickerel (Special Concern). Karst feature SE1 (high constraint) is located on this reach near Griffin Street South bridge. High-constraint Karst features indicate that development should avoid the feature which should be buffered. The karst feature does not encompass the entire reach. Management requirements related to high-constraint karst should be considered for this HDF.
TM3(1)1	Y	Low	Medium	High	Medium	Low (karst) High (groundwater)	Medium	Seep located at lower 75m portion of reach which contributes cold water to TM3. Karst feature SE3 (low constraint) present on this reach: Intermittent surface stream draining north to 20 Mile Ck. that loses flow in at least two reaches. Low karst constraint indicates the potential for the feature to be removed (excavated and grouted) and by-passed by runoff
TM3(1)2	Y	Low	Medium	Low	Low	Low	Medium	Karst feature SE3 (low constraint) present on this reach: Intermittent surface stream draining north to 20 Mile Ck. that loses flow in at least two reaches. Low karst constraint indicates the potential for the feature to be removed (excavated and grouted) and by-passed by runoff.
TM3(1)3	Y	Low	Medium	Medium	Low	Low	Medium	
TM4		High	High	High	High	High	High	Karst feature SW4 (high constraint) located at south bank of 20 Mile Creek immediately upstream of pedestrian bridge. Not visible at high flow but otherwise has distinct flow from the creek. High-constraint Karst features indicate that development should avoid the feature and should be buffered. The karst feature does not encompass the entire reach. Management requirements related to high-constraint karst should be considered for this HDF. Opportunity to enhance the riparian zone where it is narrow or absent.
TM4(2)1	Y	Medium	Medium	Low	Low	Low	Medium	Reach downstream of SW2 sinkhole (high constraint), grassy mown area, SWM inputs.

Figure A-3: Appendix G-1, Table 1: Watercourse and Headwater Drainage Feature Classification (Wood, 2022a)

Table 1: Watercourse and Headwater Drainage Feature Classification

Discipline	Definition	Management Strategy
Red Stream Classification (solid red lines). These features are high constraint watercourses that have attributes (e.g. floodplains, unstable banks) that attract NPCA regulations. They must remain open and protected in their present condition and location, with the exception of select locations where rehabilitation may be of benefit to the system.		
Surface Water	These corridors contain a well-defined channel within a well-defined and established valley system, with large contributing drainage areas (i.e. 200 ha or more).	Watercourse and corridor to be protected in current form and location, with applicable regulatory setbacks and ecological buffers.
Geomorphology	These corridors contain a defined active channel with well-developed channel morphology (i.e., riffle-pool), material sorting, floodplain development, and/or a well-defined valley. These corridors offer both form and function and have been identified as 'no touch' reaches that must be maintained undisturbed in their present condition, except for select locations where rehabilitation may be of benefit to the system. They have usually been deemed high-quality systems that could not be re-located and replicated in a post-development scenario.	Watercourse to be protected with meander belt in current form and location. Minor modification through rehabilitation/enhancement may be acceptable in select location where it is a benefit to the system. Options • Do nothing: Corridors must remain where they are in the landscape. Delineate meander belt or erosion hazard corridor depending on valley classification. Determine additional regulatory setbacks as required. • Channel adjustments may be permitted at select locations given sufficient rationale (e.g. addressing an immediate high-risk erosion hazard, or an essential infrastructure for servicing issue such as road crossings or channel lowering). Natural channel design to be implemented for any adjustments. • Degraded (channelized and straightened) portions may by realigned using natural channel design, if realignment does not negatively impact rehabilitation.
Fisheries	Permanently wetted (flowing or standing water over most of watercourse length) that is generally associated with continuous or seasonal groundwater discharge, or with wetland storage and/or pond flows. Fish community (or the potential for) is present and natural habitat is	Watercourse to be protected/enhanced in current form and location. Minor modification through rehabilitation/enhancement may be acceptable in select location where it is a benefit to the system. Options

Discipline	Definition	Management Strategy
	usually fully developed. Either habitat and/or flow source characteristics may be difficult to replicate or maintain. -and/or- Habitat occupied by species at risk.	• Preserve the existing drainage feature and groundwater discharge or wetland in-situ. Key features of this are: 1) Maintain existing water source: e.g. incorporation of shallow groundwater and base flow protection techniques such as infiltration treatment; examine need to incorporate groundwater flows through infiltration measures (i.e. third pipes, etc.) to ensure no net loss or, if appropriate, potential gain. 2) Drainage feature must connect to downstream watercourse/habitat. 3) Stormwater management (e.g. extended detention outfalls) are to be designed and located to avoid and/or minimize impacts (i.e. sediment, temperature) to fish habitat. • Channel adjustments may be permitted at select locations given sufficient rationale (e.g. addressing an immediate high-risk erosion hazard, or a critical servicing issue), and habitat features can be restored. Natural channel design to be implemented for any adjustments. • Degraded (channelized and straightened) portions may by realigned using natural channel design if realignment does not negatively impact rehabilitation potential. For example, a more rigorous investigation may be required to ensure realignment does not result in a reduction in groundwater inputs.
Terrestrial	The watercourse segments that are within terrestrial features that are of high ecological quality; are determined to be provincially, regionally, and/or locally significant; and/or are determined to provide critical habitat functions for wildlife (e.g. consistent with criteria for Significant Wildlife Habitat).	Watercourse to be protected/enhanced in current form and location.

Discipline	Definition	Management Strategy
	Red HDF Classification (dashed red-white lines). These features, classed as [1]Protection, must remain open and, in general, remain protected in their present condition and location. They may have attributes that attract NPCA regulations.	
Surface Water	These are drainage features for which the application of the HDF Guidelines (TRCA/CVC, 2014) result in a "Protection" management strategy.	For drainage features in this category, follow the HDF management guidelines for "Protection".
Geomorphology	same as above	same as above
Fisheries	same as above	same as above
Terrestrial	The drainage feature reach segments that are within terrestrial features that are of high ecological quality; are determined to be provincially, regionally, locally significant, and/or are determined to provide critical habitat functions for wildlife (e.g. consistent with criteria for Significant Wildlife Habitat).	Drainage feature to be protected/enhanced in current form and location.
Blue Stream Classification (solid blue lines). These features are medium constraint watercourses that have attributes (e.g. floodplains, unstable banks) that attract NPCA regulations. They must remain open but they can be realigned using natural channel design.		
Surface Water	These reaches have relatively smaller contributing drainage areas (i.e. between 50 ha and 200 ha), and typically are not located within defined valley corridors.	Watercourse to remain open. Realignment may be acceptable. Reconstructed watercourse and corridor would be protected by applicable regulatory setbacks and ecological buffers.
Geomorphology	These reaches have well-defined morphology (defined bed and banks, evidence of erosion/sedimentation, and sorted substrate). These reaches maintain geomorphic function and have potential for rehabilitation. In many cases, these reaches are presently exhibiting evidence of geomorphic instability or environmental degradation due to historic modifications and land use practices.	Watercourse to be protected with applicable meander belt and setbacks. Realignment may be acceptable when deemed appropriate for restoration and enhancement or to address an essential infrastructure for servicing issue. Options • Do nothing: Leave the corridors in their present condition and develop outside of their boundaries: Delineate appropriate meander belt or erosion hazard

Discipline	Definition	Management Strategy
		corridor depending on valley classification. Determine additional regulatory setbacks as required. • Enhance existing conditions: maintain the present location of the corridor but enhance the existing conditions (e.g. bank stabilization, re-establish a meandering planform, connect channel to functioning floodplain). Natural channel design to be implemented for any adjustments. Channel adjustments may be permitted for essential infrastructure for servicing (e.g. road crossings or channel lowering). All proposed works are to include sufficient rationale and be approved by regulatory agencies. • Re-locate and enhance existing conditions: many of the reaches within the study area have undergone extensive straightening and modification for agricultural drainage purposes. As such, they are not as sensitive to re-location and would benefit from enhancements such as the re-establishment of a meandering planform with functioning floodplain and development of a riffle-pool morphology (i.e. natural channel design). In the event that these reaches are re-located, the corridor width (meander belt width/hazard corridor) associated with each reach must, at a minimum, be maintained. For reaches that have been straightened, appropriate surrogate reaches or empirical methods should be applied to determine the meander belt corridor. Natural channel design to be implemented for any realignment or adjustments. • For features with realignment opportunities around roads, consideration should be made to select appropriate locations for realignment with respect to the road location, and to reduce the number of road crossings, where appropriate. This should reduce

Discipline	Definition	Management Strategy
		overall environmental impacts from roads Such changes require approval by regulatory agencies
Fisheries	Seasonally wetted (flowing or standing water) that is generally associated with seasonally high groundwater discharge or seasonally extended contributions from wetlands/ponds (no perennial flow). May provide an extended seasonal migration route for fish. Fish community (or the potential for) is present for an extended seasonal period. Potential permanent refuge fish habitat may be provided by naturally occurring storage features such as channel pools, wetlands, and other water bodies.	Watercourse to remain open. Realignment may be acceptable if habitat features and/or flow source can be maintained, replicated, or enhanced. Options • Watercourse remains open and in place, while maintaining (or replicating if appropriate) existing flow source from seasonal groundwater, surface or wetland flows. • Watercourse may be realigned using natural channel design techniques to provide habitat features to maintain or enhance overall fish productivity of the reach. Existing seasonal groundwater, surface, or wetland flows must be maintained (or replicated if appropriate), and drainage feature must connect to downstream habitat.
Terrestrial	Watercourse segment that is within terrestrial features that are determined to be of low or moderate ecological quality; are determined to be not provincially, regionally, and/or locally significant; and/or are determined to not provide critical habitat functions for wildlife (e.g. consistent with criteria for Significant Wildlife Habitat). -and/or- Watercourse segment that is determined to provide significant linkage function for wildlife (as per Significant Wildlife Habitat).	Follow management strategies outlined for fisheries and fluvial, and ensure that the corridor is sufficiently wide and has appropriate restored habitat that supports movement of wildlife.

Discipline	Definition	Management Strategy
Yellow Classification (solid yellow lines). These features are HDFs classed as [1]Conservation, must remain open but can be realigned using natural channel design. They do not have attributes that attract NPCA regulations. The classification and management of terrestrial functions will result from being classed [1]Maintain or Replicate Terrestrial Functions.		
Surface Water	These are HDFs for which the application of the HDF Guidelines (TRCA/CVC, 2014) result in a "Conservation" management strategy.	For HDFs in this category, follow the HDF management guidelines for "Conservation".
Geomorphology	same as above	same as above
Fisheries	same as above HDFs classed as "Conservation" may provide an ephemeral aquatic linkage2 that flows for a very short period (typically in the early spring) that may provide a migration route for fish to move upstream to a valued permanent water storage feature, over a period of hours to a few days. 2An ephemeral aquatic linkage does not provide habitat in which fish may take up residence, though fish may become trapped in minor features and persist for a while until they perish.	same as above
Terrestrial	HDF classification guidelines result in a "Maintain Terrestrial Linkage – Terrestrial Functions" management strategy.	Follow HDF management guidelines for "Maintain Terrestrial Linkage – Terrestrial Functions"
Green Classification (solid green lines). These features are HDFs classed as [1]Mitigation, and do not have attributes that attract NPCA regulations. They need not remain open, but their function to the watershed system must be maintained or replicated.		
Surface Water	These are HDFs for which the application of the HDF Guidelines (TRCA/CVC, 2014) result in a "Mitigation" management strategy.	For HDFs in this category, follow the HDF management guidelines for "Mitigation".
Geomorphology	same as above	same as above
Fisheries	same as above	same as above

Discipline	Definition	Management Strategy
Terrestrial	HDF classification guidelines result in a "Replicate Terrestrial Linkage – Terrestrial Functions" management strategy.	Follow HDF management guidelines for "Replicate Terrestrial Linkage – Terrestrial Functions"
Green Classification (dashed green lines). These are HDFs classed as [1]No Management Required.		
Surface Water	These are HDFs for which the application of the HDF Guidelines (TRCA/CVC, 2014) result in "No Management Required".	For HDFs in this category, follow the HDF management guidelines for "No Management Required".
Geomorphology	same as above	same as above
Fisheries	same as above	same as above
Terrestrial	same as above	same as above

Appendix B

Species at Risk Screening Resources

Table A 1. SAR Screening Resources

Screening Resource	Description
Natural Heritage Information Center (NHIC)	The Natural Heritage Information Center (NHIC), operated by the Ontario Ministry of Natural Resources and Forestry, collects, reviews, manages and distributes information on Ontario's biodiversity. Data distributed by the NHIC is used in conservation and natural resource management decision making and was a primary resource for this report. Through the NHIC Make-a-Map tool, data on species, plant communities, wildlife concentration areas and natural areas is made accessible to the public and professionals using generalized 1-kilometer grid units to protect sensitive information. The mapping interface provides current and historical occurrences of SAR within the specified grid unit. The database also identifies environmental designations which provide insight into habitat potential including wetland, areas of natural and scientific interests and woodlands.
Breeding Bird Atlas	The atlas divides the province into 10×10 km squares and then birders find as many breeding species as possible in each square. Atlassers who know birds well by song complete 5-minute "Point Counts", 25 of which are required to provide an index of the abundance of each species in a square. Data from every square are mapped to show the distribution of each species. Point count data from each square show how the relative abundance of each species varies across the province.
eBird	eBird data document bird distribution, abundance, habitat use, and trends through checklist data collected within a simple, scientific framework. Birders enter when, where, and how they went birding, and then fill out a checklist of all the birds seen and heard during the outing. eBird's free mobile app allows offline data collection anywhere in the world, and the website provides many ways to explore and summarize your data and other observations from the global eBird community. eBird hotspots that are within 1 km of the Study Area are selected for species review.
Ontario Moth Atlas	The Ontario Moth Atlas is a project of the Toronto Entomologists' Association. The atlas currently covers about 250 species from 7 of the best-known families. The atlas presently includes 62,000 records. The last update of the atlas was in April 2020. The atlas is updated at least every 3 months. Most atlas data come from iNaturalist records. However, there is some data from Chris Schmidt of Agriculture Canada, the BOLD (Barcode of Life Datasystems) project of the University of Guelph, and from other records submitted directly to the TEA. The atlas uses the same 10×10 km squares at the Breeding Bird Atlas.
Ontario Butterfly Atlas	The Ontario Butterfly Atlas is a project of the Toronto Entomologists' Association (TEA). The TEA has been accumulating records and publishing annual seasonal summaries (Ontario Lepidoptera) for 50 years, with the first edition appearing in 1969. Atlas data comes from eButterfly records, iNaturalist records, BAMONA records, and records submitted directly to the TEA. The atlas uses the same 10×10 km squares at the Breeding Bird Atlas.
i-Naturalist	i-Naturalist is a nature app that helps public identify plants and animals. Using algorithms as well as scientists and taxonomic experts' multiple observations can be identified at a research scale. This data generated by the iNat community can be used in science and conservation. The program actively distributes the data in venues where scientists and land managers can find it. I-Naturalist has a project group for (NHIC) Rare species of Ontario. GeoProcess only records observations with-in 1 km of the Study Area.
Fisheries and Ocean Aquatic Species at Risk Maps	The DFO has compiled critical habitat and distribution data for aquatic species listed under the Species at Risk Act (SARA). The interactive map is intended to provide an overview of the distribution of aquatic species at risk and the presence of their critical habitat within Canadian waters. The official source of information is the Species at Risk Public Registry. Using this map, a 1 km radius circle is outlined around aquatic features located within the Study Area.

Appendix C

Species Ranking Systems

Table A 2. Species Ranking Systems

Rank System	Code	Meaning
OBBA Breeding Level		
Possible	H	Species observed in breeding season in suitable nesting habitat.
	S	Singing male present or breeding calls heard in breeding season in suitable habitat.
Probable	P	Pair observed in their breeding season in suitable habitat.
	T	Permanent territory presumed through registration of territorial song or presence of adult bird in breeding habitat on at least 2 days, one week or more apart at the same place.
	D	Courtship or display between a male and female, or two males including courtship feeding and copulation.
	V	Visiting probable nest site.
	A	Agitated behavior or anxiety calls of adults.
	B	Brood patch on adult female or cloacal protuberance on adult male.
	N	Nest building or excavation of nest hole.
Confirmed	DD	Distraction display or injury feigning.
	NU	Used nest or eggshell found (occupied/laid during atlas period).
	FY	Recently fledged young or downy young.
	AE	Adults leaving or entering nest site in circumstances indicating occupied nest.
	FS	Adult carrying faecal sac.
	CF	Adult carrying food for young.
	NE	Nest containing eggs.
	NY	Nest with young seen or heard.
NHIC S-Rank		
SH	Possibly Extirpated (Historical); species occurred historically and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years.	
S1	Critically Imperiled. Extremely rare in Ontario; usually 5 or fewer occurrences in the province.	
S2	Imperiled. Very rare in Ontario; usually between 6 and 20 occurrences in the province.	
S3	Vulnerable. Rare to uncommon in Ontario; usually between 21 and 60 occurrences in the province; may have fewer occurrences, but with some extensive examples remaining.	
S4	Apparently secure. Considered to be common in Ontario. It denotes a species that is apparently secure, with over 80 occurrences in the province.	
S5	Secure. Indicates that a species is widespread in Ontario. It is demonstrably secure in the province.	
?	Indicates some uncertainty with the classification due to insufficient information.	
SNR	Not Ranked.	
SNA	Not Applicable, a conservation status rank is not applicable because the species is not a suitable target for conservation activities.	
SARO/ESA & SARA Rankings		
SC	Special Concern.	
END	Endangered.	
THR	Threatened.	
EX	Extirpated.	

Appendix D

Significant Wildlife Habitat Screening

Table A 3. Significant Wildlife Habitat Assessment Table for EcoRegion 7E - Niagara Region Template

Seasonal Concentration Areas of Animals					
Wildlife Habitat	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H.	Assessment of Habitat in E.I.S. Study Area
		E.L.C. Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Waterfowl Stopover and Staging Areas (Aquatic) Rationale: Important for local and migrant waterfowl populations during the spring or fall migration or both periods combined. Sites identified are usually only one of a few in the eco-district.	American Black Duck Northern Pintail Gadwall Blue-winged Teal Green-winged Teal American Wigeon Northern Shoveler Tundra Swan Canada Goose Cackling Goose Snow Goose American Black Duck Northern Pintail Northern Shoveler American Wigeon Gadwall Green-winged Teal Blue-winged Teal Hooded Merganser Common Merganser Lesser Scaup Greater Scaup Long-tailed Duck Surf Scoter White-winged Scoter Black Scoter Ring-necked duck Common Goldeneye Bufflehead Redhead Ruddy Duck Red-breasted Merganser	MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7	• Ponds, marshes, lakes, bays, coastal inlets and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as a S.W.H., however a reservoir managed as a large wetland or pond/lake does qualify • These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water). <u>Information Sources</u> • Environment Canada • Naturalist clubs often are aware of staging/stopover areas. • O.M.N.R.F. Wetland Evaluations indicate presence of locally and regionally significant waterfowl staging. • Sites documented through waterfowl planning processes (e.g. EHJV implementation plan) • Ducks Unlimited projects • Element occurrence specification by Nature Serve: http://www.natureserve.org • Natural Heritage Information Centre (N.H.I.C.) Waterfowl Concentration Area	Studies carried out and verified presence of: • Aggregations of 100 or more of listed species for 7 days, results in >700 waterfowl use days • Areas with annual staging of ruddy ducks, canvasbacks, and redheads are S.W.H. • The combined area of the E.L.C. ecosites and a 100m radius area is the S.W.H. • Wetland area and shorelines associated with sites identified within the S.W.H.T.G. Appendix K are significant wildlife habitat. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” • Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species numbers and dates recorded). • S.W.H. M.I.S.T. Index #7 provides development effects and mitigation measures.	No habitat features present on Subject Property. Additionally, no species aggregations were observed during any of the field investigations.

	Brant Canvasback Ruddy Duck				

Seasonal Concentration Areas of Animals					
Wildlife Habitat	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H.	Assessment of Habitat in E.I.S. Study Area
		E.L.C. Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Shorebird Migratory Stopover Area Rationale: High quality shorebird stopover habitat is extremely rare and typically has a long history of use.	Greater Yellowlegs Lesser Yellowlegs Marbled Godwit Hudsonian Godwit Black-bellied Plover American Golden-Plover Semipalmated Plover Solitary Sandpiper Spotted Sandpiper Semipalmated Sandpiper Pectoral Sandpiper White-rumped Sandpiper Baird's Sandpiper Least Sandpiper Purple Sandpiper Stilt Sandpiper Short-billed Dowitcher Red-necked Phalarope Whimbrel Ruddy Turnstone Sanderling Dunlin	BBO1 BBO2 BBS1 BBS2 BBT1 BBT2 SDO1 SDS2 SDT1 MAM1 MAM2 MAM3 MAM4 MAM5	• Shorelines of lakes, rivers and wetlands, including beach area, bars and seasonally flooded, muddy and un-vegetated shoreline habitats • Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October • Sewage treatment ponds and storm water ponds do not qualify as S.W.H.. <u>Information Sources</u> • Western hemisphere shorebird reserve network • Canadian Wildlife Service (C.W.S.) Ontario Shorebird Survey • Bird Studies Canada • Ontario Nature • Local birders and naturalist clubs • Natural Heritage Information Centre (N.H.I.C.) Shorebird Migratory Concentration Area	Studies confirming: • Presence of 3 or more of listed species and >1000 shorebird use days during spring or fall migration period (shorebird use days are the accumulated number of shorebirds counted per day over the course of the fall or spring migration period) • Whimbrel stop briefly (<24hrs) during spring migration, any site with >100 Whimbrel used for 3 years or more is significant. • The area of significant shorebird habitat includes the mapped E.L.C. shoreline ecosites plus a 100m radius area • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • S.W.H. M.I.S.T. Index #8 provides development effects and mitigation measures.	No habitat features on site.

Seasonal Concentration Areas of Animals					
Wildlife Habitat	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H.	Assessment of Habitat in E.I.S. Study Area
		E.L.C. Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Raptor Wintering Area Rationale: Sites used by multiple species, a high number of individuals and used annually are most significant	Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl Special Concern: Short-eared Owl Bald Eagle	Hawks/Owls: Combination of E.L.C. Community Series; need to have present one Community Series from each land class; Forest: FOD, FOM, FOC. Upland: CUM, CUT, CUS, CUW. Bald Eagle: Forest Community Series: FOD, FOM, FOC, SWD, SWM or SWC on shoreline areas adjacent to large rivers or adjacent to lakes with open water (hunting area).	• The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors • Raptor wintering (hawk/owl) sites need to be >20 ha with a combination of forest and upland • Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands • Field area of the habitat is to be wind swept with limited snow depth or accumulation. • Eagle sites have open water and large trees and snags available for roosting <u>Information Sources</u> • O.M.N.R.F. Ecologist or Biologist • Naturalist clubs • Natural Heritage Information Centre (N.H.I.C.) Raptor Winter Concentration Area • Data from Bird Studies Canada • Results of Christmas Bird Counts • Reports and other information available from Conservation Authorities	Studies confirm the use of these habitats by: •One or more Short-eared Owls or; One or more Bald Eagles or; At least 10 individuals and two of the listed hawk/owl species. •To be significant a site must be used regularly (3 in 5 years) for a minimum of 20 days by the above number of birds. •The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area •Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” •S.W.H. M.I.S.T. Index #10 and #11 provides development effects and mitigation measures.	Habitat is present in woodlands south of the Subject Property beyond the 120 m Study Area boundary: in combination with open agricultural fields, potential habitat features may be present.

Seasonal Concentration Areas of Animals					
Wildlife Habitat	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H.	Assessment of Habitat in E.I.S. Study Area
		E.L.C. Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Bat Hibernacula Rationale: Bat hibernacula are rare habitats in all Ontario landscapes.	Big Brown Bat	Bat Hibernacula may be found in these ecosites: CCR1 CCR3 CCA1 CCA2 (Note: buildings are not considered S.W.H.)	• Hibernacula may be found in caves, mine shafts, underground foundations and Karsts • Active mine sites should not be considered as S.W.H. • The locations of Bat Hibernacula are relatively poorly known. <u>Information Sources</u> • O.M.N.R.F. for possible locations and contact for local experts • Natural Heritage Information Centre (N.H.I.C.) Bat Hibernaculum • Ministry of Northern Development and Mines for location of mine shafts. • Clubs that explore caves (e.g. Sierra Club) • University Biology Departments with bat experts.	• All sites with confirmed hibernating bats are S.W.H. • The area includes 200 m radius around the entrance of the hibernaculum for most development types and 1000 m for wind farms • Studies are to be conducted during the peak swarming period (Aug. – Sept.). Surveys should be conducted following methods outlined in the “Bats and Bat Habitats: Guidelines for Wind Power Projects” • S.W.H. M.I.S.T. Index #1 provides development effects and mitigation measures.	Exfoliating bark on living trees and multiple snags were observed on site. However, communities do not reflect SWH.

Seasonal Concentration Areas of Animals					
Bat Maternity Colonies Rationale: Known locations of forested bat maternity colonies are extremely rare in all Ontario landscapes.	Big Brown Bat Silver-haired Bat	Maternity colonies considered S.W.H. are found in forested Ecosites. All E.L.C. Ecosites in E.L.C. Community Series: FOD, FOM, SWD, SWM	• Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be S.W.H.). • Maternity roosts are not found in caves and mines in Ontario • Maternity colonies located in Mature deciduous or mixed forest stands with >10/ha large diameter (>25cm dbh) wildlife trees • Female bats prefer wildlife trees (snags) in early stages if decay, class 1-3 or class 1 or 2 • Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred <u>Information Sources</u> • O.M.N.R.F. for possible locations and contact for local experts • University Biology Departments with bat experts.	• Maternity colonies with confirmed use by: o >10 Big Brown Bats o >5 adult female Silver-haired Bats • The area of habitat includes the entire woodland or a forest stand E.L.C. Ecosite or an Ecoelement containing the maternity colonies • Evaluation methods for maternity colonies should be conducted following methods outlined in the “Bats and Bat Habitats: Guidelines for Wind Power Projects” • S.W.H. M.I.S.T. Index #12 provides the development effects and mitigation measures.	Exfoliating bark and six snags are present on site. However, the quality of snags is not high enough to be considered bat roosting habitat.

Seasonal Concentration Areas of Animals					
Wildlife Habitat	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H.	Assessment of Habitat in E.I.S. Study Area
		E.L.C. Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Turtle Wintering Areas Rationale: Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant	Special Concern: Midland Painted Turtle Northern Map Turtle Snapping Turtle	Snapping and Midland Painted Turtles: SW, MA, OA and SA; FEO and BOO. Northern Map Turtle: Open water areas such as deeper rivers or streams and lakes with current can also be used as overwintering habitat.	• For most turtles, wintering areas are in the same general areas as their core habitat. Water has to be deep enough not to freeze and have soft mud substrates. • Overwintering sites are permanent water bodies, large wetlands and bots or fens with adequate dissolved oxygen. • Manmade ponds such as sewage lagoons or storm water ponds should not be considered S.W.H.. <u>Information Sources</u> • E.I.S. studies carried out by conservation authorities. • Field naturalists clubs. • O.M.N.R.F. ecologist or biologist • N.H.I.C.	• Presence of five overwintering Midland Painted Turtles is significant. • One or more Northern Map Turtle or Snapping Turtle overwintering within a wetland is significant. • The mapped E.L.C. ecosite area with the overwintering turtles is the S.W.H.. If the hibernation site is within a stream or river, the deep-water pool where the turtles are overwintering is the S.W.H.. • Overwintering areas may be identified by searching for congregations (basking areas) of turtles on warm, sunny days during the fall (September to October) or spring (March to May). Congregation of turtles is more common where wintering areas are limited and therefore significant. • S.W.H. M.I.S.T. Index #28 provides development effects and mitigation measures for turtle wintering habitat	No habitat features on site.

Seasonal Concentration Areas of Animals					
Wildlife Habitat	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H.	Assessment of Habitat in E.I.S. Study Area
		E.L.C. Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Reptile Hibernaculum Rationale: Generally sites are the only known sites in the area. Sites with the highest number of individuals are	Snakes: Eastern Gartersnake Northern Watersnake Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake Special Concern: Milksnake Eastern Ribbonsnake	For all snakes, habitat may be found in any ecosite other than very wet ones. Talus, Rock Barren, Crevice, Cave, and Alvar sites may be directly related to these habitats. Observations or congregations of snakes on sunny warm days in the spring or fall is a good indicator.	• For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural or naturalized locations. The existence of features that go below frost line; such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate S.W.H. • Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line • Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover. <u>Information Sources</u> • In spring, local residents or landowners may have observed the emergence of snakes on their property (e.g. old dug wells). • Reports and other information available from Conservation Authorities. • Field Naturalist Clubs • University herpetologists • Natural Heritage Information Centre (N.H.I.C.)	Studies confirming: • Presence of snake hibernacula used by a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. • Congregations of a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. near potential hibernacula (e.g. foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct) • NOTE: If there are Special Concern Species present, then site is S.W.H. • NOTE: Sites for hibernation possess specific habitat parameters (e.g. temperature, humidity, etc) and consequently are used annually, often by many of the same individuals of a local population (i.e. strong hibernation site fidelity). Other critical life processes (e.g. mating) often take place in close proximity to hibernacula. • The feature in which the hibernacula is located plus a 30 m radius area is the S.W.H. • S.W.H. M.I.S.T. Index #13 provides development effects and mitigation measures for snake hibernacula.	No habitat features present on Subject Property. SWS confirmed no SWH. Habitat features do exist beyond the southern property boundary.

Seasonal Concentration Areas of Animals					
Wildlife Habitat	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H.	Assessment of Habitat in E.I.S. Study Area
		E.L.C. Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Colonially-Nesting Bird Breeding Habitat (Bank and Cliff) Rationale: Historical use and number of nests in a colony make this habitat significant. An identified colony can be very important to local populations. All swallow population are declining in Ontario.	Cliff Swallow Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies)	Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles Cliff faces, bridge abutments, silos, barns. Habitat found in the following ecosites: CUM1 CUT1 CUS1 BLO1 BLS1 BLT1 CLO1 CLS1 CLT1	• Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area. • Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles. • Does not include a licensed/permitted Mineral Aggregate Operation. <u>Information Sources</u> • Reports and other information available from Conservation Authorities • Ontario Breeding Bird Atlas • Bird Studies Canada NatureCounts http://www.birdscanada.org/birdmon • Field Naturalist Clubs	Studies confirming: • Presence of 1 or more nesting sites with 8 or more cliff swallow pairs and/or rough-winged swallow pairs during the breeding season. • A colony identified as S.W.H. will include a 50m radius habitat area from the peripheral nests • Field surveys to observe and count swallow nests are to be completed during the breeding season. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” • S.W.H. M.I.S.T. Index #4 provides development effects and mitigation measures.	No suitable habitat on site.

Seasonal Concentration Areas of Animals					
Colonially-Nesting Bird Breeding Habitat (Tree/Shrubs) Rationale: Large colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Great Blue Heron Black-crowned Night-Heron Great Egret Green Heron	SWM2 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1	• Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used. • Most nests in trees are 11 to 15 m from ground, near the top of the tree. <u>Information Sources</u> • Ontario Breeding Bird Atlas colonial nest records. • Ontario Heronry Inventory 1991 available from Bird Studies Canada or N.H.I.C. (O.M.N.R.F.). • Natural Heritage Information Centre (N.H.I.C.) Mixed Wader Nesting Colony • Aerial photographs can help identify large heronries. • Reports and other information available from Conservation Authorities. • M.N.R.F. District Offices • Field Naturalist Clubs.	Studies confirming: • Presence of 2 or more active nests of Great Blue Heron or other listed species. • The habitat extends from the edge of the colony and a minimum 300m radius or extent of the Forest Ecosite containing the colony or any island <15 ha with a colony is the S.W.H. • Confirmation of active heronries are to be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the presence of fresh guano, dead young and/or eggshells • S.W.H. M.I.S.T. Index #5 provides development effects and mitigation measures.	No habitat features on site.

Seasonal Concentration Areas of Animals					
Wildlife Habitat	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H.	Assessment of Habitat in E.I.S. Study Area
		E.L.C. Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Colonially -Nesting Bird Breeding Habitat (Ground) Rationale: Colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern Caspian Tern Brewer's Blackbird	Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1;50,000 NTS map). Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird) MAM1 – 6 MAS1 – 3 CUM CUT CUS	• Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas. • Brewers Blackbird colonies are found loosely on the ground in or in low bushes in close proximity to streams and irrigation ditches within farmlands. <u>Information Sources</u> • Ontario Breeding Bird Atlas, rare/colonial species records. • Canadian Wildlife Service • Reports and other information available from Conservation Authorities. • Natural Heritage Information Centre (N.H.I.C.) Colonial Waterbird Nesting Area • M.N.R.F. District Offices. • Field Naturalist Clubs	Studies confirming: • Presence of > 25 active nests for Herring Gulls or Ring-billed Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern • Presence of 5 or more pairs for Brewer's Blackbird • Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant • The edge of the colony and a minimum 150m radius area of habitat, or the extent of the E.L.C. ecosites containing the colony or any island <3 ha with a colony is the S.W.H. • Studies would be done during May/June when actively nesting. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • S.W.H. M.I.S.T. Index #6 provides development effects and mitigation measures.	No habitat in Study Area. Defining criteria not observed during breeding bird surveys.

Seasonal Concentration Areas of Animals					
Wildlife Habitat	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H.	Assessment of Habitat in E.I.S. Study Area
		E.L.C. Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Migratory Butterfly Stopover Areas Rationale: Butterfly stopover areas are extremely rare habitats and are biologically important for butterfly species that migrate south for the winter.	Painted Lady Red Admiral Special Concern: Monarch	Combination of E.L.C. Community Series; need to have present one Community Series from each landclass: FIELD: CUM, CUT, CUS FOREST: FOC, FOD, FOM, CUP Anecdotally, a candidate site for butterfly stopover will have a history of butterflies being observed.	• A butterfly stopover area will be a minimum of 10 ha in size with a combination of field and forest habitat present, and will be located within 5 km of Lake Erie or Lake Ontario • The habitat is typically a combination of field and forest, and provides the butterflies with a location to rest prior to their long migration south • The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat • Staging areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes <u>Information Sources</u> • M.N.R.F. District Offices • Natural Heritage Information Centre (N.H.I.C.) • Agriculture Canada in Ottawa may have list of butterfly experts. • Field Naturalist Clubs • Toronto Entomologists Association	Studies confirm: • The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct). MUD is based on the number of days the site is used by Monarchs, multiplied by the number of individuals using the site. Numbers of butterflies can range from 100-500/day, significant variation can occur between years and multiple years of sampling should occur • Observational studies are to be completed and need to be done frequently during the migration period to estimate MUD. • MUD of >5000 or >3000 with the presence of Painted Ladies or Red Admiral's is to be considered significant. • S.W.H. M.I.S.T. Index #16 provides development effects and mitigation measures.	No habitat features on site. Location not within habitat criteria.

Seasonal Concentration Areas of Animals					
Wildlife Habitat	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H.	Assessment of Habitat in E.I.S. Study Area
		E.L.C. Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Landbird Migratory Stopover Areas Rationale: Sites with a high diversity of species as well as high numbers are most significant.	All migratory songbirds Canadian Wildlife Service Ontario website: http://www.ec.gc.ca/nature/default.asp?lang=En&n=421B7A9D-1 All migrant raptor species: Ontario Ministry of Natural Resources: Fish and Wildlife Conservation Act, 1997. Schedule 7: Specially Protected Birds (Raptors)	All Ecosites associated with these E.L.C. Community Series: FOC FOM FOD SWC SWM SWD	• Woodlots >5 ha in size and within 5 km of Lake Erie and Lake Ontario. If woodlands are rare in an area of shoreline, woodland fragments 2-5 ha can be considered for this habitat • If multiple woodlands are located along the shoreline those woodlands <2 km from Lake Erie and Lake Ontario are more significant • Sites have a variety of habitats: forest, grassland and wetland complexes • The largest sites are more significant • Woodlots and forest fragments are important habitats to migrating birds, these features located along the shore and within 5 km of Lake Erie and Lake Ontario are Candidate S.W.H.. <u>Information Sources</u> • Bird Studies Canada • Ontario Nature • Local birders and field naturalist clubs • Ontario Important Bird Areas (IBA) Program	Studies confirm: • Use of the habitat by >200 birds/day and with >35 species and with at least 10 bird species recorded on at least 5 different survey dates. This abundance and diversity of migrant bird species is considered above average and significant • Studies should be completed during spring (Mar.-May) and fall (Aug.-Oct.) migration using standardized assessment techniques. Evaluation to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” • S.W.H. M.I.S.T. Index #9 provides development effects and mitigation measures.	Study Area not located within 5 km of Lake Erie or Lake Ontario.

Seasonal Concentration Areas of Animals					
Wildlife Habitat	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H.	Assessment of Habitat in E.I.S. Study Area
		E.L.C. Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Deer Winter Congregation Areas Rationale: Deer movement during winter in the southern areas of Eco-region 7E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands to reduce or avoid the impacts of winter conditions	White-tailed Deer	All forested Ecosites with these E.L.C. Community Series: FOC, FOM, FOD, SWC, SWM, SWD Conifer plantations much smaller than 50 ha may also be used.	• Woodlots >100 ha in size or if large woodlots are rare in a planning area, woodlots >50 ha • Deer movement during winter in the southern areas of Ecoregion 7E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands • Large woodlots >100 ha and up to 1,500 ha are known to be used annually by densities of deer that range from 0.1-0.5 deer/ha • Woodlots with high densities of deer due to artificial feeding are not significant. <u>Information Sources</u> • M.N.R.F. District Offices • LIO/NRVIS	Studies confirm: • Deer management is an M.N.R.F. responsibility, deer winter congregation areas considered significant will be mapped by M.N.R.F. • Use of the woodlot by white-tailed deer will be determined by M.N.R.F., all woodlots exceeding the area criteria are significant, unless determined not to be significant by M.N.R.F. • Studies should be complete4d during winter (Jan./Feb.) when >20 cm of snow is on the ground using aerial survey techniques, ground road surveys, or a pellet count deer survey • S.W.H. M.I.S.T. Index #2 provides development effects and mitigation measures	No habitat features on site.

Specialized Habitat for Wildlife					
Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H.	Assessment of Habitat in E.I.S. Study Area
		E.L.C. Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Waterfowl Nesting Area Rationale: Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant.	American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard	All upland habitats located adjacent to these wetland E.L.C. Ecosites are Candidate S.W.H.: MAS1, MAS2, MAS3, SAS1, SAM1, SAF1, MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SWT1, SWT2, SWD1, SWD2, SWD3, SWD4 NOTE Includes adjacency to Provincially Significant Wetlands	• A waterfowl nesting area extends 120 m from a wetland (>0.5 ha) or a wetland (>0.5 ha) and any small wetlands (0.5 ha) within 120 m or a cluster of 3 or more small (<0.5 ha) wetlands within 120 m of each individual wetland where waterfowl nesting is known to occur • Upland areas should be at least 120 m wide so that predators such as raccoons, skunks and foxes have difficulty finding nests • Wood Ducks and Hooded Mergansers utilize large diameter trees (>40 cm dbh) in woodlands for cavity nest sites. <u>Information Sources</u> • Ducks Unlimited staff may know the locations of particularly productive nesting sites • M.N.R.F. Wetland Evaluations for indication of significant waterfowl nesting habitat • Reports and other information available from Conservation Authorities	Studies confirmed: • Presence of 3 or more nesting pairs for listed species excluding Mallards, or; • Presence of 10 or more nesting pairs for listed species including Mallards. • Any active nesting site of an American Black Duck is considered significant. • Nesting studies should be completed during the spring breeding season (April - June). Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” • A field study confirming waterfowl nesting habitat will determine boundary of the waterfowl nesting habitat for the S.W.H., this may be greater or less than 120 m from the wetland and will provide enough habitat for waterfowl to successfully nest • S.W.H. M.I.S.T. Index #25 provides development effects and mitigation measures.	No habitat features on site.

Specialized Habitat for Wildlife					
Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H.	Assessment of Habitat in E.I.S. Study Area
		E.L.C. Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat Rationale: Nest sites are fairly uncommon in Eco -region 7E and are used annually by the species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat.	Osprey SPECIAL CONCERN Bald Eagle	E.L.C. Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands.	• Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. • Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy. • Nests located on man-made objects are not to be included as S.W.H. (e.g. telephone poles and constructed nesting platforms) <u>Information Sources</u> • N.H.I.C. compiles all known nesting sites for Bald Eagles in Ontario • M.N.R.F. values information (LIO/NRVIS) will list known nesting locations. Note: data from NRVIS is provided as a point and does not represent all the habitat • Nature Counts, Ontario Nest Records Scheme data. • O.M.N.R.F. District. • Check the Ontario Breeding Bird Atlas or Rare Breeding Birds in Ontario for species documented • Reports and other information available from Conservation Authorities. • Field Naturalists clubs	Studies confirm the use of these nests by: • One or more active Osprey or Bald Eagle nests in an area • Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the S.W.H.. • For an Osprey, the active nest and a 300 m radius around the nest or the contiguous woodland stand is the S.W.H., maintaining undisturbed shorelines with large trees within this area is important • For a Bald Eagle the active nest and a 400-800 m radius around the nest is the S.W.H.. Area of the habitat from 400-800 m is dependent on sight lines from the nest to the development and inclusion of perching and foraging habitat • To be significant a site must be used annually. When found inactive, the site must be known to be inactive for > 3 years or suspected of not being used for >5 years before being considered not significant. • Observational studies to determine nest site use, perching sites and foraging areas need to be done from early March to mid-August. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • S.W.H. M.I.S.T. Index #26 provides development effects and mitigation measures	No habitat features on site.

Specialized Habitat for Wildlife					
Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H.	Assessment of Habitat in E.I.S. Study Area
		E.L.C. Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Woodland Raptor Nesting Habitat Rationale: Nests sites for these species are rarely identified; these area sensitive habitats and are often used annually by these species.	Northern Goshawk Cooper's Hawk Sharp-shinned Hawk Red-shouldered Hawk Barred Owl Broad-winged Hawk	May be found in all forested E.L.C. Ecosites. May also be found in SWC, SWM, SWD and CUP3.	• All natural or conifer plantation woodland/forest stands >30 ha with > 4 ha of interior habitat. Interior habitat determined with a 200 m buffer. • Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests, within tops or crotches of trees. Species such as Cooper's Hawk nest along forest edges sometimes on peninsulas or small off-shore islands. • In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest <u>Information Sources</u> • O.M.N.R.F. Districts. • Check the Ontario Breeding Bird Atlas or Rare Breeding Birds in Ontario for species documented. • Check data from Bird Studies Canada. • Reports and other information available from Conservation Authorities.	Studies confirm: • Presence of one or more active nests from species list is considered significant • Red-shouldered Hawk and Northern Goshawk – A 400 m radius around the nest or 28 ha area of habitat is the S.W.H.. The 28 ha habitat area would be applied where optimal habitat is irregularly shaped around the nest. • Barred Owl – A 200m radius around the nest is the S.W.H. • Broad-winged Hawk and Coopers Hawk, – A 100m radius around the nest is the S.W.H. • Sharp-Shinned Hawk – A 50m radius around the nest is the S.W.H. • Conduct field investigations from early March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area. • S.W.H. M.I.S.T. Index #27 provides development effects and mitigation measures	No habitat features in EIS Study Area.

Specialized Habitat for Wildlife					
Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H.	Assessment of Habitat in E.I.S. Study Area
		E.L.C. Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Turtle Nesting Areas Rationale: These habitats are rare and when identified will often be the only breeding site for local populations of turtles	Special Concern: Midland Painted Turtle Northern Map Turtle Snapping Turtle	Exposed mineral soil (sand or gravel) areas adjacent (<100 m) or within the following E.L.C. Ecosites: MAS1, MAS2, MAS3, SAS1, SAM1, SAF1, BOO1, FEO1	• Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. • For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and is located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not S.W.H.. • Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes and rivers are most frequently used. <u>Information Sources</u> • Use Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels). • Check the Ontario Herpetofaunal Summary Atlas records or other similar atlases for uncommon turtles; location information may help to find potential nesting habitat for them. • Natural Heritage Information Centre (N.H.I.C.). • Field naturalist clubs.	Studies confirm: • Presence of 5 or more nesting Midland Painted Turtles. • One or more Northern Map Turtles or Snapping Turtles nesting is a S.W.H.. • The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30 to 100 m around the nesting area dependent on slope, riparian vegetation and adjacent land use is the S.W.H.. • Travel routes from wetland to nesting area are to be considered within the S.W.H. as part of the 30 to 100 m area of habitat. • Field investigations should be conducted in prime nesting season typically late spring to early summer. Observational studies observing the turtles nesting is a recommended method. • S.W.H. M.I.S.T. Index #28 provides development effects and mitigation measures for turtle nesting habitat.	No suitable habitat on site.

Specialized Habitat for Wildlife					
Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H.	Assessment of Habitat in E.I.S. Study Area
		E.L.C. Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Seeps and Springs Rationale: Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams.	Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer Salamanders	Seeps/springs are areas where groundwater comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	• Any forested area (with <25% meadow/field/ pasture) within the headwaters of a stream or river system • Seeps and springs are important feeding and drinking areas. Especially in the winter will support a variety of plant and animal species. <u>Information Sources</u> • Topographical Map. • Thermography. • Hydrological surveys conducted by Conservation Authorities and MOECC. • Field Naturalists Clubs and landowners. • Municipalities and Conservation Authorities may have drainage maps and headwater areas mapped	Field studies confirm: • Presence of a site with 2 or more seeps/springs should be considered S.W.H.. • The area of an E.L.C. forest ecosite or an ecoelement within ecosite containing the seeps/springs is the S.W.H.. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation the habitat • S.W.H. M.I.S.T. Index #30 provides development effects and mitigation measures	No habitat features on site.

Specialized Habitat for Wildlife					
Amphibian Breeding Habitat (Woodland) Rationale: These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	All Ecosites associated with these E.L.C. Community Series: FOC, FOM, FOD, SWC, SWM, SWD Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians.	• Presence of a wetland, pond or woodland pool (including vernal pools) >500 m2 (about 25 m diameter) within or adjacent (within 120 m) to a woodland (no minimum size). Some small wetlands may not be mapped and may be important breeding pools for amphibians. • Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat. <u>Information Sources</u> • Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records • Local landowners may also provide assistance as they may hear spring-time choruses of amphibians on their property. • O.M.N.R.F. Districts and wetland evaluations • Field Naturalist clubs • Canadian Wildlife Service Amphibian Road Call Survey • Ontario Vernal Pool Association: http://www.ontariovernalpools.org	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog species with at least 20 individuals (adults or egg masses) or 2 or more of the listed frog species with Call Level Codes of 3. • A combination of observational study and call count surveys will be required during the spring (Mar.-Jun.) when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands • The habitat is the wetland area plus a 230m radius of woodland area. If a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is to be included in the habitat. • S.W.H. M.I.S.T. Index #14 provides development effects and mitigation measures	No habitat within the EIS Study Area. However, habitat features in woodland south of the Subject Property (>500 m) may provide habitat.

Specialized Habitat for Wildlife					
Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H.	Assessment of Habitat in E.I.S. Study Area
		E.L.C. Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Amphibian Breeding Habitat (Wetlands) Rationale: Wetlands supporting breeding for these amphibian species are extremely important and fairly rare within Central Ontario landscapes.	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	E.L.C. Community Classes SW, MA, FE, BO, OA and SA. Typically these wetland ecosites will be isolated (>120 m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (e.g. Bullfrog) may be adjacent to woodlands.	• Wetlands >500m2 (about 25m diameter), supporting high species diversity are significant; some small or ephemeral habitats may not be identified on M.N.R.F. mapping and could be important amphibian breeding habitats • Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators • Bullfrogs require permanent water bodies with abundant emergent vegetation. <u>Information Sources</u> • Ontario Herpetofaunal Summary Atlas (or other similar atlases) • Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count. • O.M.N.R.F. Districts and wetland evaluations. • Reports and other information available from Conservation Authorities	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog/toad species with Call Level Codes of 3 or; Wetland with confirmed breeding Bullfrogs are significant • The E.L.C. ecosite wetland area and the shoreline are the S.W.H. • A combination of observational study and call count surveys will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the wetlands. • If a S.W.H. is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • S.W.H. M.I.S.T. Index #15 provides development effects and mitigation measures.	No habitat within the EIS Study Area. However, habitat features south of the Subject Property (>500 m) may provide habitat.

Specialized Habitat for Wildlife					
Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H.	Assessment of Habitat in E.I.S. Study Area
		E.L.C. Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Woodland Area -Sensitive Bird Breeding Habitat Rationale: Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest song birds.	Yellow-bellied Sapsucker Red-breasted Nuthatch Veery Blue-headed Vireo Northern Parula Black-throated Green Warbler Blackburnian Warbler Black-throated Blue Warbler Ovenbird Scarlet Tanager Winter Wren Pileated Woodpecker Special Concern: Cerulean Warbler Canada Warbler	All Ecosites associated with these E.L.C. Community Series: FOC, FOM, FOD, SWC, SWM, SWD	• Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha • Interior forest habitat is at least 200 m from forest edge habitat Information Sources: • Local birder clubs. • Canadian Wildlife Service (CWS) for the location of forest bird monitoring. • Bird Studies Canada conducted a 3-year study of 287 woodlands to determine the effects of forest fragmentation on forest birds and to determine what forests were of greatest value to interior species • Reports and other information available from Conservation Authorities.	Studies confirm: • Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. • Note: any site with breeding Cerulean Warblers or Canada Warblers is to be considered S.W.H. • Conduct field investigations in spring and early summer when birds are singing and defending their territories • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” • S.W.H. M.I.S.T. Index #34 provides development effects and mitigation measures HABITATS OF SPECIES OF CONSERVATION CONCERN	No habitat features on site.

Habitat for Species of Conservation Concern (Not including Endangered or Threatened Species)					
Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H.	Assessment of Habitat in E.I.S. Study Area
		E.L.C. Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Marsh Breeding Bird Habitat Rationale: Wetlands for these bird species are typically productive and fairly rare in Southern Ontario landscapes.	American Bittern Virginia Rail Sora Common Gallinule American Coot Pied-billed Grebe Marsh Wren Sedge Wren Common Loon Green Heron Trumpeter Swan Special Concern: Black Tern Yellow Rail	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SAS1 SAM1 SAF1 FEO1 BOO1 For Green Heron: all SW, MA and CUM1 sites	• Nesting occurs in wetlands. • All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present • For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water <u>Information Sources</u> • O.M.N.R.F. District and wetland evaluations. • Field Naturalist clubs • Natural Heritage Information Centre (N.H.I.C.) Records. • Reports and other information available from Conservation Authorities. • Ontario Breeding Bird Atlas	Studies confirm: • Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or breeding by any combination of 4 or more of the listed species • Note: any wetland with breeding of 1 or more Black Terns, Trumpeter Swan, Green Heron or Yellow Rail is S.W.H. • Area of the E.L.C. ecosite is the S.W.H.. • Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” • S.W.H. M.I.S.T. Index #35 provides development effects and mitigation measures	No habitat features on site.

Habitat for Species of Conservation Concern (Not including Endangered or Threatened Species)					
Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H.	Assessment of Habitat in E.I.S. Study Area
		E.L.C. Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Open Country Bird Breeding Habitat Rationale; This wildlife habitat is declining throughout Ontario and North America. Species such as the Upland Sandpiper have declined significantly the past 40 years based on CWS (2004) trend records.	Upland Sandpiper Grasshopper Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow Special Concern: Short-eared Owl	CUM1 CUM2	• Large grassland areas (includes natural and cultural fields and meadows) >30 ha • Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e. no row cropping or intensive hay or livestock pasturing in the last 5 years) • Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older. • The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species <u>Information Sources</u> • Agricultural land classification maps, Ministry of Agriculture. • Local bird clubs. • Ontario Breeding Bird Atlas • E.I.S. Reports and other information available from Conservation Authorities	Field studies confirm: • Presence of nesting or breeding of 2 or more of the listed species • A field with 1 or more breeding Short-eared Owls is to be considered S.W.H. • The area of S.W.H. is the contiguous E.L.C. ecosite field areas • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” • S.W.H. M.I.S.T. Index #32 provides development effects and mitigation measures	No habitat features on site.

Habitat for Species of Conservation Concern (Not including Endangered or Threatened Species)					
Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H.	Assessment of Habitat in E.I.S. Study Area
		E.L.C. Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Shrub/Early Successional Bird Breeding Habitat Rationale; This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined significantly over the past 40 years based on CWS (2004) trend records.	Indicator Species: Brown Thrasher Clay-coloured Sparrow Common Species: Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher Special Concern: Yellow-breasted Chat Golden-winged Warbler	CUT1, CUT2, CUS1, CUS2, CUW1, CUW2 Patches of shrub ecosites can be complexed into a larger habitat for some bird species	• Large field areas succeeding to shrub and thicket habitats >10 ha in size • Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (i.e. no row-cropping, haying or live-stock pasturing in the last 5 years) • Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species • Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands <u>Information Sources</u> • Agricultural land classification maps, Ministry of Agriculture. • Local bird clubs. • Ontario Breeding Bird Atlas • Reports and other information available from Conservation Authorities	Field studies confirm: • Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species • A habitat with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat • The area of the S.W.H. is the contiguous E.L.C. ecosite field/thicket area. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” • S.W.H. M.I.S.T. Index #33 provides development effects and mitigation measures	No habitat present.

Habitat for Species of Conservation Concern (Not including Endangered or Threatened Species)					
Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H.	Assessment of Habitat in E.I.S. Study Area
		E.L.C. Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Terrestrial Crayfish Rationale: Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats are very rare.	Chimney or Digger Crayfish; (*Fallicambarus fodiens*) Devil Crayfish or Meadow Crayfish; (*Cambarus diogenes*)	MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, MAS1, MAS2, MAS3, SWD, SWT, SWM CUM1 with inclusions of above meadow marsh ecosites can be used by terrestrial crayfish	• Wet meadow and edges of shallow marshes (no minimum size) should be surveyed for terrestrial crayfish • Constructs burrows in marshes, mudflats, meadows, the ground can't be too moist. Can often be found far from water • Both species are a semi-terrestrial burrower which spends most of its life within burrows consisting of a network of tunnels. Usually the soil is not too moist so that the tunnel is well-formed. <u>Information Sources</u> • Information sources from "Conservation Status of Freshwater Crayfishes" by Dr. Premek Hamr for the WWF and CNF, March, 1998	Studies confirm: • Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable meadow marsh, swamp or moist terrestrial sites • Area of E.L.C. ecosite or an ecoelement area of meadow marsh or swamp within the larger ecosite area is the S.W.H. • Surveys should be done April to August in temporary or permanent water. Note the presence of burrows or chimneys are often the only indicator of presence, observance or collection of individuals is very difficult • S.W.H. M.I.S.T. Index #36 provides development effects and mitigation measures	No habitat features present.

Habitat for Species of Conservation Concern (Not including Endangered or Threatened Species)					
Special Concern and Rare Wildlife Species Rationale: These species are quite rare or have experienced significant population declines in Ontario.	All Special Concern and Provincially Rare (S1, S2, S3, SH) plant and animal species. Lists of these species are tracked by the N.H.I.C.	All plant and animal element occurrences (EOs) within a 1 km or 10 km grid. Older EOs were recorded prior to GPS being available, therefore location information may lack accuracy.	• When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or provincially Rare species; linking candidate habitat on the site needs to be completed to E.L.C. Ecosites <u>Information Sources</u> • Natural Heritage Information Centre (N.H.I.C.) will have Special Concern and Provincially Rare (S1-S3, SH) species lists with element occurrences data. • N.H.I.C. Website “Get Information”: http://nhic.mnr.gov.on.ca • Ontario Breeding Bird Atlas • Expert advice should be sought as many of the rare spp. Have little information available about their requirements	Studies confirm: • Assessment/inventory of the site for the identified special concern or rare species needs to be completed during the time of year when the species is present or easily identifiable. • The area of the habitat to the finest E.L.C. scale that protects the habitat form and function is the S.W.H., this must be delineated through detailed field studies. The habitat needs be easily mapped and cover an important life stage component for a species e.g. specific nesting habitat or foraging habitat. • S.W.H. M.I.S.T. Index #37 provides development effects and mitigation measures	None identified. See SAR screening.

Rare Vegetation Communities					
Rare Vegetation Community	E.L.C. Ecosite Codes	Candidate S.W.H.		Confirmed S.W.H.	Assessment of Habitat in E.I.S. Study Area
		Habitat Description	Detailed Information and Sources	Defining Criteria	
Cliffs and Talus Slopes Rationale: Cliffs and Talus Slopes are extremely rare habitats in Ontario.	Any E.L.C. Ecosite within Community Series: TAO TAS TAT CLO CLS CLT	A Cliff is vertical to near vertical bedrock >3 m in height. A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris.	• Most cliff and talus slopes occur along the Niagara Escarpment <u>Information Sources</u> • The Niagara Escarpment Commission has detailed information on location of these habitats • O.M.N.R.F. Districts • Natural Heritage Information Centre (N.H.I.C.) has location information available on their website • Field Naturalist Clubs • Conservation Authorities	• Confirm any E.L.C. Vegetation Type for Cliffs or Talus Slopes • S.W.H. M.I.S.T. Index #21 provides development effects and mitigation measures	No habitat features present on site.
Sand Barren Rationale: Sand barrens are rare in Ontario and support rare species. Most Sand Barrens have been lost due to cottage development and forestry	E.L.C. Ecosites: SBO1 SBS1 SBT1 Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always <60%	Sand barrens typically are exposed sand, generally sparsely vegetated and caused by a lack of moisture, periodic fires and erosion. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered but less than 60%.	• A sand barren area >0.5 ha in size <u>Information Sources</u> • The Niagara Escarpment Commission has detailed information on location of these habitats • O.M.N.R.F. Districts • Natural Heritage Information Centre (N.H.I.C.) has location information available on their website • Field Naturalist Clubs • Conservation Authorities	• Confirm any E.L.C. Vegetation Type for Sand Barrens • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic spp.) • S.W.H. M.I.S.T. Index #20 provides development effects and mitigation measures	No habitat features present on site.

Rare Vegetation Communities					
Rare Vegetation Community	E.L.C. Ecosite Codes	Candidate S.W.H.		Confirmed S.W.H.	Assessment of Habitat in E.I.S. Study Area
		Habitat Description	Detailed Information and Sources	Defining Criteria	
Alvar Rationale: Alvars are extremely rare habitats in Ecoregion 7E.	ALO1 ALS1 ALT1 FOC1 FOC2 CUM2 CUS2 CUT2-1 CUW2 Five Alvar Indicator Species: 1) *Carex crawei* 2) *Panicum philadelphicum* 3) *Eleocharis compressa* 4) *Scutellaria parvula* 5) *Trichostema brachiatum* These indicator species are very specific to Alvars within Ecoregion 7E	An Alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plants. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animal species. Vegetation cover varies from patchy to barren with a less than 60% tree cover	• An Alvar site >0.5 ha in size • Alvar is particularly rare in Ecoregion 7E where the only known sites are found in the western islands of Lake Erie <u>Information Sources</u> • Alvars of Ontario (Federation of Ontario Naturalists, 2000) • Conserving Great Lakes Alvars (Ontario Nature) • O.M.N.R.F. Districts • Natural Heritage Information Centre (N.H.I.C.) has location information available on their website • Field Naturalist Clubs • Conservation Authorities	• Field studies identify that four of the five Alvar Indicator Species at a Candidate Alvar Site is significant • Site must not be dominated by exotic of introduced species (<50% vegetative cover are exotic spp.) • The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses • S.W.H. M.I.S.T. Index #17 provides development effects and mitigation measures	No habitat features present on site.

Rare Vegetation Communities					
Rare Vegetation Community	E.L.C. Ecosite Codes	Candidate S.W.H.		Confirmed S.W.H.	Assessment of Habitat in E.I.S. Study Area
		Habitat Description	Detailed Information and Sources	Defining Criteria	
Old Growth Forest Rationale: Due to historic logging practices and land clearance for agriculture, old growth forest is rare in Ecoregion 7E.	Forest Community Series: FOD FOC FOM SWD SWC SWM	Old Growth Forests are characterized by heavy mortality or turnover of over-storey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris.	• Woodland area is >0.5 ha <u>Information Sources</u> • O.M.N.R.F. Forest Resource Inventory mapping • O.M.N.R.F. Districts • Field Naturalist Clubs • Conservation Authorities • Sustainable Forestry License (SFL) companies will possibly know locations through field operations • Municipal forestry departments	Field studies will determine: • If dominant tree species of the forest are >140 years old, then the area containing these trees is S.W.H. • The forested area containing the old growth characteristics will have experienced no recognizable forestry activities (cut stumps will not be present) • The area of forest ecosites combined or an ecoelement within an ecosite that contain the old growth characteristics is the S.W.H. • Determine E.L.C. vegetation types for the forest area containing the old growth characteristics • S.W.H. M.I.S.T. Index #23 provides development effects and mitigation measures	No habitat features present on site.

Rare Vegetation Communities					
Savannah Rationale: Savannahs are extremely rare habitats in Ontario.	TPS1 TPS2 TPW1 TPW2 CUS2	A Savannah is a tallgrass prairie habitat that has tree cover between 25-60% In Ecoregion 7E, known tallgrass prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario).	• No minimum size to site • Site must be restored or a natural site. Remnant sites such as railway right-of-ways are not considered S.W.H. <u>Information Sources</u> • Natural Heritage Information Centre (N.H.I.C.) has location information available on their website • Field Naturalist Clubs • Conservation Authorities	Field studies confirm: • One or more of the Savannah indicator species listed in Appendix N should be present. Note: savannah plant spp. List from Ecoregion 7E should be used. • Area of the E.L.C. Ecosite is the S.W.H. • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic spp.) • S.W.H. M.I.S.T. Index #18 provides development effects and mitigation measures.	No habitat features present on site.

Rare Vegetation Communities					
Rare Vegetation Community	E.L.C. Ecosite Codes	Candidate S.W.H.		Confirmed S.W.H.	Assessment of Habitat in E.I.S. Study Area
		Habitat Description	Detailed Information and Sources	Defining Criteria	
Tallgrass Prairie Rationale: Tallgrass Prairies are extremely rare habitats in Ontario.	TPO1 TPO2	A tallgrass prairie has ground cover dominated by prairie grasses. An open tallgrass prairie habitat has <25% tree cover. In Ecoregion 7E, known tallgrass prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario).	• No minimum size to site • Site must be restored or a natural site. Remnant sites such as railway right-of-ways are not considered S.W.H. <u>Information Sources</u> • Natural Heritage Information Centre (N.H.I.C.) has location information available on their website • Field Naturalist Clubs • Conservation Authorities	Field studies confirm: • One or more of the Prairie indicator species listed in Appendix N should be present. Note: savannah plant spp. List from Ecoregion 7E should be used. • Area of the E.L.C. Ecosite is the S.W.H. • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic spp.) • S.W.H. M.I.S.T. Index #19 provides development effects and mitigation measures.	No habitat features present on site.
Other Rare Vegetation Communities Rationale: Plant communities that often contain rare species which depend on the habitat for survival.		Provincially rare (S1, S2, S3) vegetation communities are listed in Appendix M of the Significant Wildlife Habitat Technical Guide (M.N.R.F., 2000). Any E.L.C. Ecosite Code that has a possible E.L.C. Vegetation Type that is provincially rare is candidate S.W.H.. Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps.	• E.L.C. Ecosite codes that have the potential to be a rare E.L.C. Vegetation Type as outlined in Appendix M of the Significant Wildlife Habitat Technical Guide (M.N.R.F., 2000). • M.N.R.F./N.H.I.C. will have up to date listing for rare vegetation communities. <u>Information Sources</u> • Natural Heritage Information Centre (N.H.I.C.) has location information available on their website • Field Naturalist Clubs • Conservation Authorities	• Field studies should confirm if an E.L.C. Vegetation Type is a rare vegetation community based on listing within Appendix M of the Significant Wildlife Habitat Technical Guide (M.N.R.F., 2000). • Area of the E.L.C. Vegetation Type polygon is the S.W.H.. • S.W.H. M.I.S.T. Index #37 provides development effects and mitigation measures.	Habitat features are likely present beyond the Subject Property boundary in the southern portion of the proposed linkage area.

Animal Movement Corridors					
Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H.	Assessment of Habitat in E.I.S. Study Area
		E.L.C. Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Amphibian Movement Corridors Rationale: Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	Corridors may be found in all ecosites associated with water. Corridors will be determined based on identifying the significant breeding habitat for these species in Table 1.1	• Movement corridors between breeding habitat and summer habitat • Movement corridors must be determined when amphibian breeding habitat is confirmed as S.W.H. (Amphibian Breeding Habitat, Wetland) <u>Information Sources</u> • M.N.R.F. District Office. • Natural Heritage Information Centre (N.H.I.C.). • Reports and other information available from Conservation Authorities. • Field Naturalist Clubs	• Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites • Corridors should consist of native vegetation, with several layers of vegetation. Corridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant • Corridors should have at least 15m of vegetation on both sides of waterway or be up to 200m wide of woodland habitat and with gaps <20m • Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat • S.W.H. M.I.S.T. Index #40 provides development effects and mitigation measures	No habitat features present on site.