Bill No. 167
2026

By-law No. C.P.-____-___

A by-law to adopt the Kilally Meadows Environmentally Significant Area Conservation Master Plan Phase I.

WHEREAS the Official Plan, The London Plan, for the City of London Planning Area – 2016 includes policies for conservation master plans for environmentally significant areas and other natural heritage areas;

AND WHEREAS the Kilally Meadows Environmentally Significant Area Conservation Master Plan Phase I is a conservation master plan pursuant to policy 1421 of the Official Plan, The London Plan, for the City of London Planning Area – 2016;

NOW THEREFORE the Municipal Council of The Corporation of the City of London enacts as follows:

1. The Kilally Meadows Environmentally Significant Area Conservation Master Plan Phase I, as attached hereto and forming part of this by-law, is adopted.

PASSED in Open Council on April 28, 2026, subject to the provisions of PART VI.1 of the *Municipal Act*, 2001.

Josh Morgan
Mayor

Michael Schulthess
City Clerk

First Reading – April 28, 2026
Second Reading – April 28, 2026
Third Reading – April 28, 2026

Kilally Meadows

Environmentally Significant Area

Conservation Master Plan Phase I

Draft

London
CANADA

Conservation Master Plan History

The history of versions of the Conservation Master Plan (CMP) are provided in **Table 1.**

Table 1. Conservation Master Plan History

Version	Date	Author	Reviewed By	Description of Revision(s)
Ecological Restoration Plan	April 2019	William Van Hemessen	Linda McDougall	Preliminary report to inform CMP.
Conservation Master Plan (CMP) 1.0	December 2025	Pauline Catling	Lela Burt	First draft of CMP

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Statement of Limitations

This Conservation Master Plan (CMP) has been prepared for the purpose of guiding conservation, restoration, and management activities within the project area. The information, analyses, and recommendations presented are based on the best available data, professional judgment, and site assessments conducted at the time of study. While every effort has been made to ensure accuracy and completeness, the following limitations apply:

- Temporal Limitations: Natural systems are dynamic and subject to change over time. The conditions described in this plan reflect observations made during the assessment period and may not capture seasonal, annual, or longer-term ecological variability.
- Data Limitations: Certain information used in developing this plan was obtained from secondary sources or existing databases. These sources may contain inaccuracies or gaps that were beyond the control of the authors.
- Scope of Work: Field investigations and analyses were limited to the scope deemed necessary to develop a CMP. Detailed surveys (e.g., for rare species, hydrology, or soils) have been undertaken, and further specialized studies may be beneficial or necessary in future to update or supplement the data collected.
- Future Conditions: The plan does not account for unforeseen natural events (e.g., extreme weather, fire, pest outbreaks), climate change impacts, or future land use changes beyond those reasonably anticipated at the time of writing.
- Implementation: Recommendations are provided as guidance to support conservation decision-making. Actual implementation will depend on available resources, permitting requirements, stakeholder collaboration, and adaptive management as new information emerges.

This plan should be considered a living document. It is intended to inform and support conservation efforts but should not be interpreted as an absolute prediction of future conditions or outcomes. Periodic review and updates are recommended to ensure ongoing relevance and effectiveness.

Acknowledgements

Land Acknowledgement

We acknowledge that the City of London is situated on the traditional lands of the Anishinaabek, Haudenosaunee, Lūnaapéewak and Attawandaron. We acknowledge all the treaties that are specific to this area: the Two Row Wampum Belt Treaty of the Haudenosaunee Confederacy/Silver Covenant Chain; the Beaver Hunting Grounds of the Haudenosaunee NANFAN Treaty of 1701; the McKee Treaty of 1790, the London Township Treaty of 1796, the Huron Tract Treaty of 1827, with the Anishinaabeg, and the Dish with One Spoon Covenant Wampum of the Anishnaabek and Haudenosaunee.

This land continues to be home to diverse Indigenous people (First Nations, Métis and Inuit) whom we recognize as contemporary stewards of the land and vital contributors to society. We hold all that is in the natural world in our highest esteem and give honor to the wonderment of all things within Creation. We bring our minds together as one to share good words, thoughts, feelings and sincerely send them out to each other and to all parts of creation. We are grateful for the natural gifts in our world, and we encourage everyone to be faithful to the natural laws of Creation.

The three Indigenous Nations that are neighbours to London are the Chippewas of the Thames First Nation; Oneida Nation of the Thames; and the Munsee-Delaware Nation who all continue to live as sovereign Nations with individual and unique languages, cultures and customs.

This Land Acknowledgement is a first step towards reconciliation. Awareness means nothing without action. It is important that everyone takes the necessary steps towards decolonizing practices. We encourage everyone to be informed about the traditional lands, Treaties, history, and cultures of the Indigenous people local to their region.

City of London

Emily Williamson - Manager, Environmental Planning

Lela Burt – Ecologist Planner, Environmental Planning

Consultant Team (North-South Environmental Inc.)

Pauline Catling – Project Manager (CMP), Report Author (CMP)

William Van Hemessen – Project Manager and Report Author (Restoration Plan), Field Work

List of Abbreviations

Table 2. List of Abbreviations and Acronyms

Acronym	Full Definition
AODA	Accessibility for Ontarians with Disabilities Act
B	Breeding (provincial conservation status)
BMPs	Best Management Practices
C	Common (regional conservation status)
CMP	Conservation Master Plan
COTTFN	Chippewas of the Thames First Nation
CUM1	Mineral Cultural Meadow (Ecological Land Classification code)
CUS1	Mineral Cultural Savannah (ELC code)
CUT1	Mineral Cultural Thicket (ELC code)
ELC	Ecological Land Classification
EMG	Environmental Management Guidelines
END	Endangered (Species at Risk status)
ERP	Ecological Restoration Plan
ESA	Environmentally Significant Area
ESA	Endangered Species Act
FNA	Flora of North America
FOD7	Fresh-Moist Lowland Deciduous Forest (ELC code)
FOD7-3	Fresh-Moist Willow Lowland Deciduous Forest (ELC code
FOD7-5	Fresh-Moist Black Maple Lowland Deciduous Forest (ELC code)
FOD8-1	Fresh-Moist Poplar Deciduous Forest (ELC code)
hyb	Hybrid species (regional conservation status)
I	Exotic species (regional conservation status)
LIO	Land Information Ontario
LIPMS	London Invasive Plant Management Strategy
LP	London Plan
MAM2-2	Reed Canary Grass Mineral Meadow Marsh (ELC code)
MAM2-10	Forb Mineral Meadow Marsh (ELC code)
MAS2-8	Rice Cutgrass Mineral Shallow Marsh (ELC code)
MIDD	Middlesex County
MMP	Marsh Monitoring Program
MNRF	Ontario Ministry of Natural Resources and Forestry

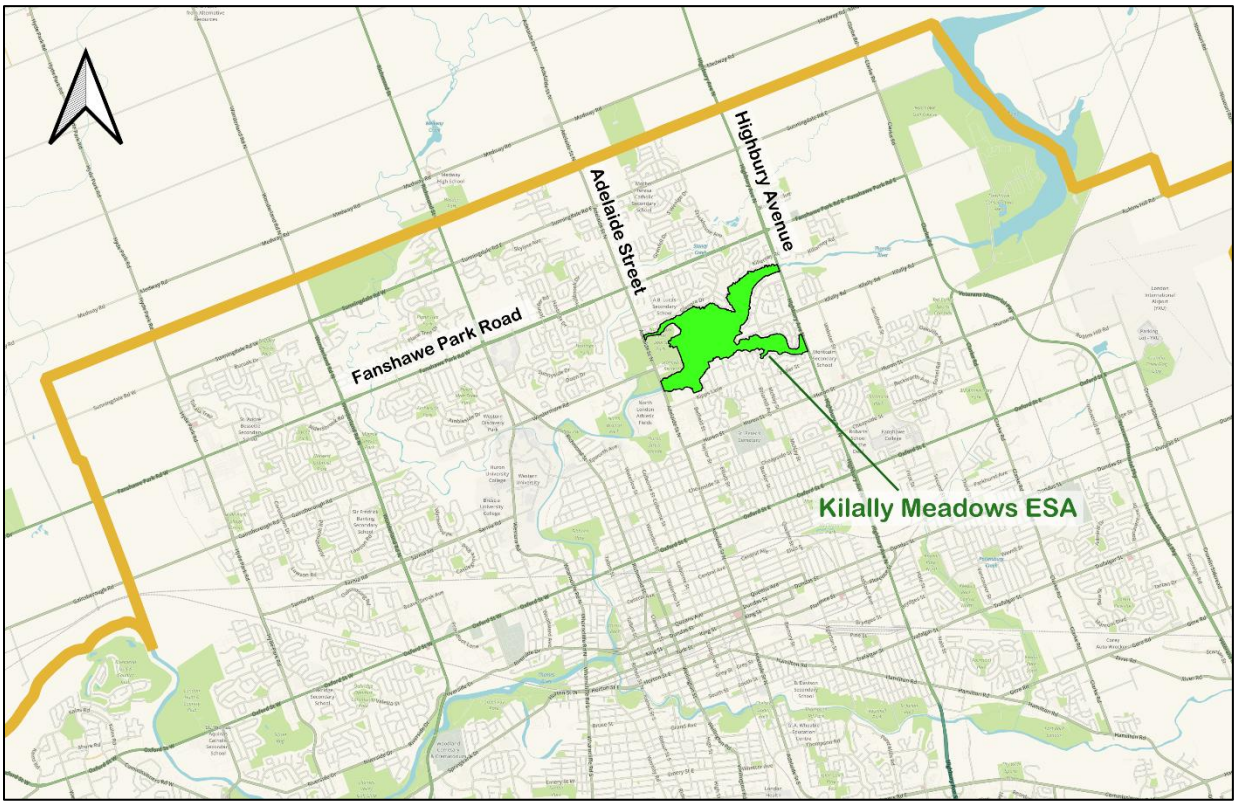
Acronym	Full Definition
N	Nesting (provincial conservation status)
NAR	Not At Risk (provincial conservation status)
NHIC	Natural Heritage Information Centre
NHS	Natural Heritage System
NSE	North-South Environmental Inc.
OBBA	Ontario Breeding Bird Atlas
OIPC	Ontario Invasive Plant Council
ROW	Right of Way
R	Regionally rare (regional conservation status)
S1	Extremely rare
S2	Very rare (provincial conservation status)
S3	Rare to uncommon (provincial conservation status)
S4	Common and apparently secure (provincial conservation status)
S5	Very common and demonstrably secure (provincial conservation status)
SARA	Species at Risk Act
SAR	Species at Risk
SC	Special Concern (Species at Risk status)
SE	Exotic (provincial conservation status)
SH	Historic (provincial conservation status)
SNR	Species not ranked (provincial conservation status)
SWH	Significant Wildlife Habitat
SWD4	Mineral Deciduous Swamp (ELC code)
SWD4-1	Willow Mineral Deciduous Swamp (ELC code)
SWT2	Mineral Thicket Swamp (ELC code)
SWT2-2	Willow Mineral Thicket Swamp (ELC code)
SWT2-5	Red-osier Mineral Thicket Swamp (ELC code)
SX	Extirpated (provincial conservation status)
THR	Threatened (Species at Risk status)
TPS2	Fresh-Moist Tallgrass Savannah (ELC code)
TPO2-1	Fresh-Moist Tallgrass Prairie (ELC code)
U	Uncommon (regional conservation status)
UTRCA	Upper Thames River Conservation Authority
X	No status / data deficient (regional conservation status)

1.0 Introduction

The City of London is undertaking natural heritage planning studies to develop Conservation Master Plans (CMPs) for several of its Environmentally Significant Areas (ESAs). These plans are used to guide management of the ESAs, which are considered the most significant and largest areas of the City's Natural Heritage System (NHS). CMPs within the City of London are undertaken in two phases. The purpose of Phase I is to inventory and evaluate the natural heritage features and functions and identify potential management issues. Phase II builds on Phase I and provides a more detailed and comprehensive management plan for the ESA. A key component of the overall CMP process is public and stakeholder engagement.

This report constitutes Phase I, Life Science Inventory and evaluation, for Kilally Meadows ESA. Kilally Meadows ESA is situated in northeast London between Adelaide Street North and Highbury Avenue North along the North Thames River (see **Figure 1**.) The ESA has long been recognized as an area of natural heritage significance within the city. With an area of 159 hectares (ha), it is also one of the City's largest ESAs.

Figure 1. Location of Kilally Meadows ESA within the City of London



In March of 2018, the City of London retained Parsons to complete an Ecological Restoration Plan (ERP) for Kilally Meadows ESA. In 2024, the need to revise the ERP to a CMP was identified, in line with *The London Plan* policy 1367. To address all CMP components, additional revision and review of the 2019 ERP was completed.

1.1 Environmentally Significant Areas (ESAs)

Policies 1367 and 1368 of *The London Plan* define ESAs as:

> "1367: Environmentally Significant Areas (ESAs) are large areas that contain natural features and perform ecological functions that warrant their retention in a natural state. Environmentally Significant Areas are large features of the Natural Heritage System, often represented by a complex of wetlands, woodlands, significant wildlife habitat or valleylands. Wetlands, areas of natural and scientific interest and species at risk (SAR) will be identified and evaluated in accordance with provincial requirements. While Environmentally Significant Areas are protected by their inclusion in the Green Space Place Type, additional measures to provide for their protection, management and utilization are considered necessary and may include the preparation of conservation master plans. Environmentally Significant Areas are delineated through the application of *Environmental Management Guidelines* and through the application of provincial guidelines."
>
> "1368: Environmentally Significant Areas that have been identified by City Council as being of city-wide, regional, or provincial significance are included in the Green Space Place Type on Map 1 and are identified on Map 5. New Environmentally Significant Areas may be identified by Council and added to Map 5 by amendment to this Plan and in conformity with the criteria set out in the Environmentally Significant Areas policies of this Plan. Areas that have the potential to meet the criteria for an Environmentally Significant Area but have not been thoroughly studied are identified as potential Environmentally Significant Areas on Map 5 and are included in the Environmental Review Place Type on Map 1. Further study of these areas following City policies and guidelines is required through any planning and development application process. Environmentally Significant Areas recognized by Council are identified as [ESAs] on Map 5 and included in the Green Space Place Type on Map 1."

Environmentally Significant Areas are recognized and designated as fully protected natural areas that contain natural features and perform ecological functions that warrant their protection in a natural state. In the hierarchy of the Natural Heritage System, ESAs are

considered the largest, highest quality areas within the City. They represent areas that may have unusual geological processes, contribute important hydrological functions related to wetlands and watercourses, contain high quality vegetation communities, rare and uncommon vegetation communities and species, including Species at Risk, are of sufficiently large size to support critical wildlife habitat and linkage functions, and represent important areas of biodiversity. Protection of important ecological areas, including the physical and ecological features and functions that sustain these areas, is therefore the primary management goal for ESAs.

1.2 ESA Designation Criteria

Previous studies pertaining to Kilally Meadows ESA include the Kilally Open Space Management Plan (London Public Utilities Commission, 1990) and the Kilally Open Space Master Plan (BioLogic, 1999). These studies, along with the studies associated with the Life Science Inventory conducted by Parsons in 2018 (as detailed in Parsons and NSE, 2019), confirm that Kilally Meadows satisfies all the criteria for recognition as an ESA as defined in Policy 1371 of *The London Plan*. An evaluation based on each criterion is represented below in **Table 3**.

Table 3. ESA Designation criteria for Kilally Meadows

ESA Criterion	Evaluation
Criterion 1: The area contains unusual landforms and/or rare to uncommon natural communities within the country, province or London subwatershed region.	• Contains Fresh-Moist Tallgrass Prairie (TPO2-1) and Fresh-Moist Tallgrass Savannah (TPS2) both of which are rare vegetation communities in Ontario.
Criterion 2: The area contains high-quality natural landform-vegetation communities that are representative of typical pre-settlement conditions of the dominant physiographic units within the London subwatershed region, and/or that have been classified as distinctive in the Province of Ontario	• Contains Fresh-Moist Tallgrass Prairie (TPO2-1) and Fresh-Moist Tallgrass Savannah (TPS2) both of which are representative of typical precolonial conditions, are considered rare habitats in Ontario, and are designated Significant Wildlife Habitat for Ecoregion 7E.
Criterion 3: The area, due to its large size, generally more than 40 hectares,	• Kilally Meadows is approximately 159 hectares in size[1]

ESA Criterion	Evaluation
provides habitat for species intolerant of disturbance or for species that require extensive blocks of suitable habitat.	• The following area sensitive species were identified in field investigations: Common Merganser, Hairy Woodpecker, White-breasted Nuthatch, Blue-gray Gnatcatcher, Magnolia Warbler, Blackburnian Warbler, Least Flycatcher (MNRF, 2000)[2]
Criterion 4: The area, due to its hydrologic characteristics, contributes significantly to the healthy maintenance (quality or quantity) of a natural system beyond its boundaries.	• Contains the North Thames River, Meander Creek, McNay Drain, and several other drainage features • Occupies the floodplain of the North Thames River and is almost entirely within the regulatory floodplain • Area contains multiple wetland features
Criterion 5: The area has a high biodiversity of biological communities and/or associated plant and animal species within the context of the London subwatershed region.	• Field studies identified: 17 ELC Vegetation Types, 10 Community Series, 387 vascular plant species, 69 bird species, eight herpetofauna species, and 27 arthropod species, indicating high biodiversity
Criterion 6: The area serves an important wildlife habitat or linkage function.	• Kilally Meadows forms part of the Thames River corridor and is linked to the parkland and natural areas along the Thames River, including Kilally Woods and Stoney Creek Meadows.
Criterion 7: The area provides significant habitat for rare, threatened or endangered indigenous species of plants or animals that are rare within the country, province or county.	• Field studies identified: 13 rare plant species and nine species listed as Endangered, Threatened or Special Concern under the Endangered Species Act, in Kilally Meadows.

[1] Increased from 119 ha based on updated ESA Boundary

[2] Area sensitive species that were observed during field investigations but do not have suitable habitat in Kilally Meadows ESA were not included in the list (MNRF, 2000).

1.3 Vision for the Conservation Master Plan (CMP)

The CMP is part of a municipal planning process that provides a framework for the assessment of ESAs within the City and the development of a management plan that serves as a guideline for the protection, management, and potential expansion of ESA boundaries. Building on existing information on the ESA, a CMP addresses natural features and their significance or sensitivity, public access and use, and identification of degraded or disturbed areas that present opportunities for restoration and rehabilitation. The City can utilize this process to identify lands that may be acquired within or adjacent to the existing ESA to improve resiliency, diversity and connectivity between natural features within the greater landscape. Resources to assist with the management and restoration initiatives in ESA's include the expertise of staff from the Upper Thames River Conservation Authority (UTRCA).

1.3.1 Goal

The primary goal of a CMP is to develop a long-term approach to the management of an ESA, including ecological stability and protection, through the implementation of an environmental management strategy.

1.3.2 Guiding Principles

The following policies from **Section 2.1** of *Guidelines for Management Zones and Trails in Environmentally Significant Areas* (City of London, 2016) will lead the decision-making process regarding the future of Kilally Meadows ESA:

- Natural features and ecological functions for which the ESA has been identified shall be protected.
- The ecological integrity and ecosystem health of the ESA shall have priority in any use or design-related decision.
- A properly designed and implemented trail system appropriate to specific management zones and reflecting sensitivity of the natural features will be implemented to achieve the primary objective of protection and the secondary objective of providing suitable recreational and educational opportunities.
- The community will be engaged, as appropriate, in natural areas protection and the trail planning process to build awareness, foster education, and encourage participation to increase the capacity for creating a conservation culture that promotes natural areas as a common good and conservation as a collective responsibility.

- Enjoyable, safe, accessible trails for recreation appropriate in an ESA and learning environment will be permitted in accordance with any/all recognized accessibility legislation (such as the Accessibility for Ontarians with Disabilities Act, 2005 (AODA), best practices and the above principles.

1.3.3 Objectives

The objectives of the Phase I CMP are to inventory the flora and fauna of the ESA, evaluate the significance of the flora and fauna and the ecological communities they form, identify the vegetated boundary of the ESA, and identify management zones as well as management threats, including a review of the existing trails.

1.4 CMP Planning Process

A combination of background document and mapping review pertaining to Kilally Meadows ESA and field inventory completed by Parsons' ecologists was used to establish a current baseline for natural heritage and identify priorities for management.

2.0 Life Science Inventory Methods

Completing a Life Science Inventory is an important first step in the development of a CMP. The resulting data, and its analysis, provides the framework for assessing the status of the natural features and for the evaluation of the ESA.

The Life Science Inventory preparation process included a review of background materials pertaining to Kilally Meadows ESA and field investigations to document existing natural heritage features, in 2018.

2.1 Background Data Review

The field investigations conducted for the Ecological Restoration Plan (ERP) for Kilally Meadows Environmentally Significant Area prepared by Parsons and North-South Environmental Inc. (2019) form the basis of the data in the Life Science Inventory of this CMP. Similar to a CMP, an ERP functions as a tool to guide the management and restoration of an ESA and has a particular focus on invasive species management. The existing natural heritage features documented in the ERP have been used as the baseline for this CMP and the scope of the proposed restoration efforts has been expanded beyond invasive species management to include management zone application and existing trail compatibility review.

Prior to the initiation of the ERP, additional studies were completed in Kilally Meadows ESA and the surrounding area, for projects such as the Kilally Open Space Management Plan (London

Public Utilities Commission, 1990) and the Kilally Open Space Master Plan (BioLogic, 1999). A full list of previous studies that were consulted during the ERP and CMP preparation can be found in **Section 9**.

In addition to previous studies pertaining specifically to the ESA, a variety of data sources were consulted to identify species, physiographic features and hydrological features in the area for the ERP. These included:

- historical imagery of the area;
- geospatial data provided by the City of London, UTRCA, and Land Information Ontario (LIO) at the Ontario Ministry of Natural Resources and Forestry (MNRF);
- the Natural Heritage Information Centre's (NHIC's) online database provided by MNRF; and
- other natural heritage databases, such as the Ontario Breeding Bird Atlas (OBBA), eBird, and the Ontario Reptile and Amphibian Atlas (Ontario Nature).

Background information identified a number of data gaps, such as additional Species at Risk (SAR) and species of conservation concern that have been listed since the 1999 Kilally Meadows Open Space Master Plan and new criteria for identifying Significant Wildlife Habitat (SWH) that was released by MNRF. As part of the ERP, field investigations were also completed to supplement this data.

2.2 Field Methods

Field investigation data collection is a critical component of the CMP preparation process. Field investigations were conducted by a Parsons ecologist between April and September, 2018, and consisted of:

- high-level classification of vegetation communities in the ESA using the Ecological Land Classification (ELC) System for Southern Ontario (Lee et al., 1998);
- a three-season (spring, summer and fall) inventory of plant species in the ESA;
- mapping the locations and densities of invasive species throughout the ESA;
- amphibian breeding surveys following the Marsh Monitoring Program (MMP) protocol;
- breeding bird surveys using the OBBA protocol;
- documentation of other wildlife observed incidentally within the ESA; and
- review of SWH in the ESA using the criteria in the Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (MNRF, 2015).

For the purposes of vegetation community assessment (i.e., ELC) and mapping invasive species, vegetation in the ESA was delineated into polygons. Polygons were first delineated on aerial imagery of the ESA and were later refined based on observations in the field (see **Map 2** in **Appendix A**). Vegetation in each polygon was assessed at a high level using ELC, and the percentage cover of various invasive species was estimated. These polygons were then used to develop the Restoration Overlays described in **Section 5.2.2**.

Table 4 lists the date of field visits, the surveyor, and the field work tasks conducted by Parsons in 2018. The results of field investigations are discussed in **Section 3.0**.

Table 4. Parsons field investigations

Date	Surveys / Target Data	Surveyor	Weather Conditions
23 April, 2018	Amphibian breeding surveys, bat acoustic surveys	Will Van Hemessen	Clear, 13°C
24 April, 2018	Amphibian breeding surveys, bat acoustic surveys	Will Van Hemessen	Overcast, 12°C
7 May, 2018	Spring vegetation surveys	Will Van Hemessen	Sunny, 18°C
8 May, 2018	Spring vegetation surveys	Will Van Hemessen	Sunny, 23°C
9 May, 2018	Spring vegetation surveys	Will Van Hemessen	Overcast, 26°C
16 May, 2018	Walkthrough with ESA management team and Silv-Econ for *Hypena opulenta* release scoping	Will Van Hemessen	Sunny, 25°C
23 May, 2018	Spring vegetation surveys, amphibian breeding surveys, bat acoustic surveys	Will Van Hemessen	Clear, 18°C
24 May, 2018	Spring vegetation surveys, amphibian breeding surveys, bat acoustic surveys	Will Van Hemessen	Clear, 18°C
4 June, 2018	Breeding bird surveys, spring vegetation inventories	Will Van Hemessen	Sunny, 21°C
11 June, 2018	Amphibian breeding surveys, bat acoustic surveys	Will Van Hemessen	Clear, 19°C
15 June, 2018	Breeding bird surveys, ELC, spring vegetation inventories	Will Van Hemessen	Sunny, 26°C

26 June, 2018	Breeding bird surveys	Will Van Hemessen	Sunny, 13°C
28 June, 2018	Breeding bird surveys, ELC, spring vegetation inventories	Will Van Hemessen	Sunny, 28°C
23 August, 2018	ELC, summer vegetation inventories, invasive species mapping	Will Van Hemessen	Sunny, 26°C
11 September, 2018	ELC, fall vegetation inventories, invasive species mapping	Will Van Hemessen	Sunny, 23°C
12 September, 2018	ELC, fall vegetation inventories, invasive species mapping	Will Van Hemessen	Sunny, 23°C
Throughout all visits	Incidental observations of wildlife	Will Van Hemessen	N/A

2.3 Policy Updates

The Life Science Inventory Methods were updated to adhere with policy changes that occurred up to and including the July 2025. The following are relevant policy changes and their updates that are relevant to the Kilally Meadows ESA CMP:

- The *Provincial Planning Statement* (2024) came into effect on October 20, 2024, replacing the Provincial Policy Statement (2020). No major changes were made to the natural heritage component of the Provincial Planning Statement.
- The list of Species at Risk (SAR) in the CMP has been updated to include all species that have been uplisted or downlisted either provincially or federally as of 2024. These species include Barn Swallow and Monarch.
- The City of London's updated *Environmental Management Guidelines* (EMG, 2025) came into effect in July 2025 replacing the 2021 version. Of the updates made, changes to the woodland feature definition (EMG, Section 8.0) and the wording of the boundary delineation guidelines (Section 4.0) influence the contents of this report. All in-text references to previous versions of the EMG have been updated to reflect the 2025 guideline document.

3.0 Life Science Inventory Results

3.1 Physiographic Setting

Kilally Meadows ESA is located in the London Annex of the Caradoc Sand Plains, a region of sandy and gravelly outwash deposited by glacial meltwaters (Chapman and Putnam, 1984). The ESA occupies the North Thames River floodplain and is almost entirely within the Conservation Authority Regulated Area (UTRCA, 2018). Because of its floodplain setting, topography throughout much of the ESA is decidedly flat, with elevation changes no greater than 2 m to 5 m. Shallow ridges and depressions within the floodplain reflect the changing course of the Thames River over the past 14,000 years since the retreat of the Wisconsonian glaciers. Steep valley slopes at the northern and southern edges of the ESA represent the edges of the floodplain.

3.2 Land Use History

The area now encompassed by Kilally Meadows ESA has a long history of use by humans. Following the settlement and colonization of the London area in the mid-1800s, most of the ESA was cleared and used as pasture, presumably for cattle. Pastureland can be seen in historical imagery as recently as 1960. Historical imagery also shows active aggregate extraction occurring in Kilally Meadows as recently as 1960. All aggregate extraction had ceased by 1967. Aggregate extraction occurred in the north-central part of the ESA in an area now occupied by a complex of wetland habitats and thickets (e.g., polygons 10 to 18).

Neighbourhood development began around Kilally Meadows in the early 1960s, at which point aggregate extraction and agriculture uses, in what is now the ESA, ceased. Installation of utility infrastructure in the ESA began with the construction of residential developments in the surrounding area in the 1960s. The combination of pasturing and aggregate extraction resulted in major changes to the surficial geology and soils in the ESA, as well as the introduction of numerous invasive species. Much of the existing vegetation in the ESA, including forests, is in an early successional state following the cessation of these activities.

3.3 Utilities

Utility infrastructure crosses Kilally Meadows ESA at several locations; these utilities include sanitary sewers, storm sewers, a transmission line, and an oil pipeline (see **Map 1** in **Appendix A**). The right of way (ROW) width for these utilities varies from 4 m to 8 m. Inside the ROW for these utilities it is expected that restoration to a natural state may not be possible due to ongoing infrastructure access and maintenance requirements. The Utility Overlay is discussed in more detail in **Section 5.2.1**.

3.4 Surface Water Features

Although the CMP is focused primarily on terrestrial habitats, hydrological features in Kilally Meadows ESA, and the aquatic habitat they provide, are fundamentally linked to the ESA's terrestrial ecosystems. Terrestrial habitats in Kilally Meadows ESA act as pollution buffers and attenuate overland flows into the Thames River and other surface water features. Restoration and management of terrestrial ecosystems will therefore contribute to the health of aquatic ecosystems.

3.4.1 North Thames River

The most important and most prominent hydrological feature in Kilally Meadows ESA is the North Thames River, which flows generally in an east-west direction bisecting the ESA. This reach of the North Thames River is well-studied and known to provide habitat for a diversity of aquatic and terrestrial species including several rare species and Species at Risk (SAR). Rare and at-risk fish and mussel species occur in the river within Kilally Meadows ESA and are sensitive to changes in water quality and quantity in the river. The river also provides breeding, foraging, and overwintering habitat for terrestrial SAR such as snakes, turtles, and birds. The Council approved Thames Valley Corridor Plan states that "*the City recognizes the Thames Valley Corridor as its most important natural, cultural, recreational and aesthetic resource*" (Dillon Consulting Ltd. and D.R. Poulton and Associates, 2011).

3.4.2 Meander Creek

Meander Creek enters the Thames River after flowing approximately 1.5 km through the southeastern portion of the ESA. Meander Creek is a warm water system that is generally slow moving and stagnant. Within the ESA, there are at least two beaver dams impounding the creek and restricting flows. The dams are monitored frequently to ensure they do not cause negative impacts to critical infrastructure and beavers are protected as per the Humane Urban Wildlife Conflict Policy Beaver Protocol (City of London, 2017a). Meander Creek follows a natural geometry with extensive riparian vegetation for most of its length within the ESA.

3.4.3 McNay Drain

McNay Drain enters the Thames River approximately 200 m downstream from Meander Creek after flowing 230 m in a south-north direction through Kilally Meadows ESA. McNay Drain is an engineered, highly channelized drain with virtually no natural geometry. Within the ESA, the drain has extensive riparian vegetation. Before entering the ESA, however, McNay Drain has little to no riparian vegetation.

3.4.4 Other Surface Water Features

Several other drainage features are present in Kilally Meadows ESA. There is a drainage channel the flows in a north-south direction for approximately 500 m through the ESA from a storm sewer outlet south of Glengarry Avenue to the Thames River. A narrow inlet of the Thames River in the north portion of the ESA (east of Rideau Court) may be a relic of a historical alignment of the Thames River. There is a permanently flooded pond in the southern portion of the ESA. It is unclear whether the pond is a natural or anthropogenic feature.

3.5 Vegetation

A total of 387 vascular plant species were identified in Kilally Meadows ESA in the spring, summer, and fall of 2018 (see **Appendix C**). This included several provincially and regionally rare plant species (see **Section 3.5.2**) and various invasive plant species (see **Section 3.5.3**).

3.5.1 ELC Communities

A total of 17 vegetation community types were classified at a high level in Kilally Meadows ESA using ELC (see **Table 5**). One of the challenges in classifying vegetation communities in Kilally Meadows ESA using ELC is that the history of human disturbance has resulted in a complex patchwork of community types in various stages of succession. Many areas can be described as "complexes" of meadows and thickets composed of early successional, and frequently non-native, plant species. Delineating individual meadow and thicket communities in some areas is impractical, so some vegetation communities have been described as complexes of cultural meadows and thickets to accurately represent their composition.

Overall, vegetation communities in Kilally Meadows ESA reflect the floodplain setting, having moist soil and evidence of sediment deposition from periodic flooding. Much of the ESA is covered by fresh-moist deciduous forest communities. Common tree species in these communities are typical of Carolinian floodplain forests: Eastern Cottonwood (*Populus deltoides*), Northern Hackberry (*Celtis tenuifolia*), American Sycamore (*Platanus occidentalis*), Black Maple (*Acer nigrum*), Bur Oak (*Quercus macrocarpa*), etc.

Tallgrass prairies and savannahs are present in Kilally Meadows ESA, and these represent rare vegetation communities in Ontario. Prairie indicator species such as Big Bluestem (*Andropogon gerardii*), Indian Grass (*Sorghastrum nutans*), and Little Bluestem (*Schizachyrium scoparium*) are present in other vegetation communities, suggesting that prairies and savannahs were historically more extensive in the ESA. Several provincially and regionally rare plant species are also indicative of historical prairie habitat.

Wetland communities in Kilally Meadows ESA include marshes and swamps. Thicket swamps dominated by non-native species, such as Glossy Buckthorn (*Frangula alnus*) are the most common.

Table 5. Vegetation Communities in Kilally Meadows ESA

ELC Code	Community Type	Area (ha)	Description Comments
CUM1	Mineral Cultural Meadow (polygons: 3, 8, 21, 45, 48)	5.4	Mineral cultural meadows have few, if any, trees and shrubs and are dominated by grasses and forbs. They typically represent an early stage of natural succession following human disturbance. Cultural meadows in Kilally Meadows ESA are dominated by exotic cool season grasses such as Smooth Brome (*Bromus inermis*), Creeping Bentgrass (*Agrostis stolonifera*), and Orchard Grass (*Dactylis glomerata*). Notably, some cultural meadows contain low densities of prairie grasses and other prairie indicator species. Cultural meadows also contain abundant milkweeds (*Asclepias spp.*), the required larval food plant of Monarch butterfly.
CUS1	Mineral Cultural Savannah (polygon 35)	1.37	Polygon #35 was classified as a cultural savannah community because it contains scattered mature Bur Oaks with understory and groundcover dominated by exotic species such as Common Buckthorn (*Rhamnus cathartica*) and cool season grasses. This community may represent a historical Bur Oak savannah community.
CUT1	Mineral Cultural Thicket (polygons: 4, 12, 34, 39, 42)	9.02	Cultural thickets in Kilally Meadows ESA are characterized by dense colonies of Common Buckthorn and Grey Dogwood (*Cornus racemosa*). They typically represent a later stage of succession than cultural meadow communities.

ELC Code	Community Type	Area (ha)	Description Comments
CUM1 / CUT1	Mineral Cultural Meadow/Mineral Cultural Thicket Complex (polygons: 15, 19, 25, 32, 37, 38)	17.55	Much of Kilally Meadows ESA consists of a patchwork of cultural meadows and thickets representing an early stage of succession following human disturbance. These areas exhibit open patches of exotic cool season grasses interspersed with patches of Common Buckthorn and dogwood thickets.
FOD7	Fresh-Moist Lowland Deciduous Forest (polygons: 1, 5, 9, 20, 31, 33, 40, 49)	38.48	Most of Kilally Meadows ESA is covered by deciduous forests with moist soils and evidence of sediment deposition from periodic flooding events. Dominant canopy species include Manitoba Maple, Northern Hackberry, and American Sycamore. Ground cover is often sparse in these communities, owing to frequent scouring during flooding events. Exotic species, such as Common Buckthorn, are often common in the understory. Ash (*Fraxinus spp*.) trees that have died from the invasive insect, Emerald Ash Borer (*Agrilus planipennis*), are abundant in some areas.
FOD7-3	Fresh-Moist Willow Lowland Deciduous Forest (polygons: 6, 44)	8.87	Characterized by moist soil, as described above, but with the canopy dominated by willows (*Salix spp*.), most commonly White Willow (*S. alba*).
FOD7-5	Fresh-Moist Black Maple Lowland Deciduous Forest (polygons: 43)	3.67	Polygon 43 is a fresh-moist lowland deciduous forest, as described above, with the canopy dominated by Black Maple. Bitternut Hickory (*Carya cordiformis*) and Northern Hackberry are also abundant. This community contains a high density of spring ephemeral plant species and contains dense ground cover relative to other lowland forest communities.

ELC Code	Community Type	Area (ha)	Description Comments
FOD8-1	Fresh-Moist Poplar Deciduous Forest (polygons: 7, 22, 26, 29, 30, 46, 47)	25.60	Forest communities dominated by Eastern Cottonwood are especially widespread along the Thames River in the eastern portion of the ESA These communities are characterized by moist soil with evidence of scouring and sediment deposition from periodic flooding events. Ground cover, therefore, is generally sparse in these communities. Polygon 30 is the exception, having a relatively high density of spring ephemerals and other herbaceous species.
MAM2-2	Reed Canary Grass Mineral Meadow Marsh (polygons: 28, 41)	2.11	This community type is characterized by being flooded in spring but typically drying out by late summer. Reed Canary Grass (*Phalaris arundinacea*) is the dominant species.
MAM2-10	Forb Mineral Meadow Marsh (polygon 24)	0.39	Polygon #24 is a meadow marsh dominated by forbs such as Spotted Joe Pye-weed (*Eutrochium maculatum*) and asters (*Symphyotrichum spp.).* There is also abundant Interior Sandbar Willow (*Salix interior*), suggesting succession towards a thicket swamp type community.
MAS2-8	Rice Cutgrass Mineral Shallow Marsh (polygon 36)	0.13	Polygon 36 represents riparian areas around a small pond in the southern part of the ESA. These areas are dominated by Rice Cutgrass (*Leersia oryzoides*) and are permanently or seasonally flooded.
SWD4	Mineral Deciduous Swamp (polygon 23)	0.22	Polygon 23 was characterized as a swamp community based on hydrological characteristics (e.g. evidence of seasonal flooding) and vegetation (e.g., ground cover containing obligate wetland species). The

ELC Code	Community Type	Area (ha)	Description Comments
			canopy is dominated by Eastern Cottonwood and American Sycamore.
SWD4-1	Willow Mineral Deciduous Swamp (polygon 11)	1.68	Polygon 11 is a permanently flooded swamp community with a canopy dominated by exotic willows: Chinese Willow (*Salix matsudana*) and White Willow.
SWT2	Mineral Thicket Swamp (polygons: 10, 14, 17)	1.85	Mineral thicket swamps in the ESA are permanently or seasonally flooded and are dominated by invasive Glossy Buckthorn (*Frangula alnus*) and Common Buckthorn.
SWT2-2	Willow Mineral Thicket Swamp (polygons: 2, 13)	0.55	Vegetation communities 2 and 13 are thicket swamps dominated by willows. Polygon 13 contains a notable diversity of willow species for Middlesex County and is also the only significant amphibian breeding habitat in the ESA.
SWT2-5	Red-osier Mineral Thicket Swamp (polygon 18)	0.99	Polygon 18 is a thicket swamp dominated by Red-osier Dogwood (*Cornus sericea*) with abundant buckthorns and other exotic species.
TPO2-1	Fresh-Moist Tallgrass Prairie (polygon 16)	0.86	Polygon 16 was classified as a tallgrass prairie because it is dominated by Indian Grass and other prairie indicator species. Other vegetation communities in the ESA contain prairie grasses but not at densities sufficient for classification as tallgrass prairie.
TPS2 / CUT1	Fresh-Moist Tallgrass Savannah/Mineral Cultural Thicket Complex (polygon 27)	2.60	Polygon 27 contains scattered large Bur Oaks with abundant prairie grasses and was tentatively classified as a tallgrass savannah community. However, some areas are succeeding into cultural thickets due to invasive Common Buckthorn.

3.5.2 Rare Plant Species

A list of provincially and regionally rare plant species is provided in **Table 6**. Regional rarity (i.e., plant rarity in Middlesex County) was determined using the List of the Vascular Plants of Ontario's Carolinian Zone (Ecoregion 7E) (Oldham, 2017). Provincial rarity was determined according to the Natural Heritage Information Centre's status list (NHIC, 2018). Provincially and regionally rare plant species in Kilally Meadows ESA include species associated with wet prairies (e.g., Soft-hairy False Gromwell, Great Plains' Ladies'-tresses, Whorled Milkweed, Smooth Horsetail, and Hoary Vervain), floodplain woods (e.g., Butternut, Striped Cream Violet, One-flowered Cancer-root, and Spring Clearweed), and riparian habitats (e.g., Red-rooted Flatsedge, Marsh Horsetail, and Philadelphia Panicgrass). The importance of these and other communities for providing habitat for rare plant species is reflected in the Restoration Overlays in **Section 5.2.2**.

Table 6. Rare plant species in Kilally Meadows ESA

Species	Status	Polygons	Discussion
Provincially Rare			
Soft-hairy False Gromwell *Lithospermum parviflorum*	NHIC – S2 MIDD – R	15, 16, 19, 27, 45	Soft-hairy False Gromwell was identified at numerous locations throughout the ESA. Most plants are located on the northern portion of the ESA in open, prairie-like habitat, but there is one population in the southern portion in a sedge meadow near Meander Creek. Habitat for this species is shown on **Map 3** in **Appendix A**. Soft-hairy False Gromwell is a rare in Ontario, occurring only in open floodplain habitats in the Carolinian Zone. Habitat for this species in Kilally Meadows ESA is similar to other known occurrences of this species in Ontario.
Great Plains Ladies'- tresses *Spiranthes magnicamporum*	NHIC – S3 MIDD – R	15	Seven stems of Great Plains Ladies'-tresses were identified in prairie-like habitat in the northern portion of the ESA. Habitat for this species is shown on **Map 3** in **Appendix A**. Great Plains Ladies'- tresses is rare in Ontario, occurring mainly in wet to mesic prairies in the southwestern portion of the province.
Striped Cream Violet *Viola striata*	NHIC – S3 MIDD – U	1, 43	Striped Cream Violet was identified at numerous locations throughout the ESA. Several subpopulations are very large and healthy. Habitat for this species is shown on **Map 3** in **Appendix A**. Striped Cream Violet is rare in Ontario, where it occurs only in floodplain woods in the Carolinian Zone. However, it is locally abundant, especially along the Thames River, giving it a regional status of 'U' (uncommon) in Middlesex County.
Regionally Rare			
Whorled Milkweed *Asclepias verticillata*	NHIC – S4 MIDD – R	25	Whorled Milkweed was found in a cultural meadow community north of the river. Habitat for this species is described as "open, sandy woods, and adventive along roadsides and in old fields" (MNRF, 2000).
Red-rooted Flatsedge *Cyperus erythrorhizos*	NHIC – S5 MIDD – R	22	Red-rooted Flatsedge was found growing along the Thames River. Habitat for this species is described as "emergent shorelines" (Flora of North America (FNA), 2003).
Smooth Horsetail *Equisetum laevigatum*	NHIC – S5 MIDD – R	15, 16, 19, 27	Smooth Horsetail is present in wet meadow, prairie, and savannah communities throughout the northern portion of the ESA. Habitat for this species is described as "moist prairies, riverbanks, roadsides" (FNA, 2018a).
Marsh Horsetail *Equisetum palustre*	NHIC – S5 MIDD – R	17	Marsh Horsetail was found in a thicket swamp community in the northern portion of the ESA. Habitat for this species is described as "marshes and swamps" (FNA, 2018a).
One-flowered Cancer- root *Orobanche uniflora*	NHIC – S4 MIDD – R	1, 20	One-flowered Cancer-root was found at two locations in the ESA.
Philadelphia Panicgrass *Panicum philadelphicum ssp. philadelphicum*	NHIC – S4 MIDD – R	22	Philadelphia Panicgrass was found growing along the Thames River with Red-rooted Flatsedge.

Species	Status	Polygons	Discussion
Spring Clearweed *Pilea fontana*	NHIC – S4 MIDD – R	6	Spring Clearweed was found growing in disturbed deciduous forest habitat to the north of Kilally Fields. Habitat for this species is described as "mixed woods, along streams, swamps, seepages, and marshes" (FNA, 2018b).
Floating-leaved Pondweed *Potamogeton natans*	NHIC – S5 MIDD – R	28	Floating-leaved Pondweed was found in slow-moving water in Polygon #28. Habitat for this species is described as "quiet or slow-flowing waters of ponds, lakes, and streams" (FNA, 2018c).
Fragrant Sumac *Rhus aromatica*	NHIC – S4 MIDD – R	15	Fragrant Sumac is present at several locations in the northern portion of the ESA.
Hoary Vervain *Verbena stricta*	NHIC – S4 MIDD – R	15, 16, 19, 27	Hoary Vervain is present throughout the northern portion of the ESA.

3.5.3 Invasive Plant Species

A list of invasive plant species is provided in **Table 7**. Invasive species in Kilally Meadows ESA are present at high densities in some vegetation communities (see **Map 6**, in **Appendix A**). Some invasive species are highly localized or present at low densities, making them more easily managed than more prolific species. The City, the ESA management team, and other groups have conducted extensive invasive species management in Kilally Meadows ESA. Invasive species distributions are constantly shifting; it is very possible that new invasive species have been introduced since the Life Science Inventory was completed and will be introduced to Kilally Meadows ESA in the future.

Table 7. Invasive plant species in Kilally Meadows ESA

Species	Discussion
Autumn Olive *Elaeagnus umbellata*	Autumn Olive is abundant in the northern portion of the ESA, especially in polygons 15, 19 and 21. Management of Autumn Olive should follow provincial Best Management Practices (BMPs)(Warne, 2018a).
Bird's-foot Trefoil *Lotus corniculatus*	Bird's-foot Trefoil occurs at high densities in meadow communities in Kilally Meadows ESA. This long- lived perennial was originally introduced to North America as a pasture plant and continues to be used for erosion control (Mersereau and DiTommaso, 2003).
Buckthorne (Common and Glossy) *Rhamnus cathartica / Frangula alnus*	Common Buckthorn and Glossy Buckthorn are common throughout Kilally Meadows ESA and are the dominant species in several vegetation communities, in some cases making up close to 100% of the vegetation cover. Previous work funded by the City and completed by the ESA management team and community volunteers have targeted buckthorn in many areas of the ESA.
Common Reed *Phragmites australis ssp. australis*	Common Reed is remarkably absent from Kilally Meadows ESA despite the presence of abundant suitable habitat for this species. One patch of Common Reed in the ESA was sprayed by the ESA management team in 2018. There is also Common Reed present around the pond in Polygon #36 that should be removed. Management of Common Reed should follow provincial BMPs (MNRF, 2011).
Cool Season Grasses *Poaceae spp.*	Cool season grasses generically refer to exotic grass species that are adapted to cool climates and were introduced by early settlers as pasture grasses. Common cool season species in Kilally Meadows ESA include Creeping Bentgrass, Smooth Brome, Orchard Grass, and Kentucky Bluegrass (*Poa pratensis*), and were likely introduced when parts of the ESA were used as cattle pastures. These grasses dominate most meadow and savannah communities in the ESA and, while not typically thought of as invasive, they are exotic species that occur in place of native species such as Big Bluestem, Indian Grass, and Little Bluestem.
Creeping Charlie *Glechoma hederacea*	Creeping Charlie occurs in high densities in several forest communities in Kilally Meadows ESA. While not commonly thought of as an invasive species in Ontario, it is considered invasive in parts of the United States.
Creeping Thistle or Canada Thistle *Cirsium arvense*	Creeping Thistle is present in meadow, savannah, and thicket communities throughout Kilally Meadows ESA, but generally at low densities. It occurs at high densities in polygon 45.
Crown Vetch *Securigera varia*	Dense patches of Crown Vetch are present in several meadow and forest communities in Kilally Meadows ESA.
Daylilies *Hemerocallis spp.*	Dense colonies of Daylilies are present in Vegetation Communities 1 and 29. Although these patches are localized, this species can spread aggressively and forms dense, difficult to manage monocultures.
Dog-strangling Vine *Vincetoxicum rossicum*	Dog-strangling Vine is present throughout Kilally Meadows ESA and appears to be increasing. Much work has been done by the City, the ESA management team, and the Friends of Kilally Meadows ESA to manage Dog-strangling Vine. In 2018, the ESA was the location of releases of the moth species, Hypena opulenta, for Dog-strangling Vine biological control by Silv-Econ Ltd.

Species	Discussion
Dwarf Periwinkle *Vinca minor*	Dense patches of Dwarf Periwinkle are present in several locations in the ESA. Most patches have spread into the ESA from adjacent residential backyards. One patch in the western portion of the ESA could represent the site of a former building.
Eastern Hedge Bedstraw *Galium mollugo*	Eastern Hedge Bedstraw occurs at high densities in cultural meadow communities in Kilally Meadows ESA, especially Vegetation Communities #3 and 45. This long-lived perennial can take hold in meadow and prairie communities where it easily outcompetes native plants (Mersereau and DiTommaso, 2003).
European Barberry *Berberis vulgaris*	Several European Barberry shrubs were found in the northern portion of the ESA in polygons 15, 19 and 20.
Garlic Mustard *Alliaria petiolata*	Garlic Mustard is remarkably absent from most of Kilally Meadows ESA, despite being a common invasive in deciduous forests in the London area. The largest populations of Garlic Mustard were documented in polygons 1, 33, 46, and 47. Small populations of Garlic Mustard should be looked for and removed in all forest communities in the ESA. Garlic Mustard was introduced to North America in the late 1800s as an edible and medicinal plant but has become widespread and invasive in eastern North American deciduous forests (Anderson, 2012c). Management of Garlic Mustard should follow provincial BMPs (Anderson, 2012c).
Goutweed *Aegopodium podagraria*	There are some large, dense patches of Goutweed in polygon 31 that will need to be managed in order to restore that community.
Himalayan Balsam *Impatiens glandulifera*	Himalayan Balsam is present at low densities at several locations in Kilally Meadows ESA. Dense patches were identified in Vegetation Communities 30, 47, and 48.
Hogweeds *Heracleum spp.*	Two invasive hogweed species are present in Kilally Meadows ESA: Giant Hogweed (*Heracleum mantegazzianum*) and Common Hogweed (*Heracleum sphondylium*). It is important to note that the native Cow Parsnip (*Heracleum maximum*) is also present in Kilally Meadows ESA and is probably more common than both exotic species. Giant Hogweed is the most concerning invasive hogweed because it can cause serious health impacts to humans; however, Cow Parsnip can also cause a severe reaction that is a concern for public health. The ESA management team is conducting ongoing management of Giant Hogweed and this species is now rare in the ESA. Management of Giant Hogweed should follow provincial BMPs (MacDonald and Anderson, 2012).
Honeysuckles *Lonicera spp.*	Invasive honeysuckles are present at low densities in nearly every vegetation community in Kilally Meadows ESA. Higher densities of invasive honeysuckles occur in Vegetation Communities 5, 10, and 44. Native honeysuckles are also present in the ESA. Management of invasive honeysuckles should follow provincial BMPs (Tassie and Sherman, 2014a).
Japanese Knotweed Fallopia japonica	Japanese Knotweed is present at just one location in Kilally Meadows ESA and is being actively managed by the ESA management team. This species was introduced to North America in the late 1800s, primarily as an ornamental plant. In its native range it is a pioneer species in recently disturbed habitats and it spreads rapidly in disturbed habitats in North America (Anderson, 2012d).

Species	Discussion
Knapweeds Centaurea spp.	Knapweed is abundant in meadow and savannah communities in Kilally Meadows ESA but generally at low densities. The most common species are Monckton's Knapweed (*C. x moncktonii*) and Spotted Knapweed (*C. stoebe*). Knapweeds were likely accidentally introduced to North America in pasture seed and have now become significant invasive species, especially in prairie communities (Sherman and Powell, 2017). Management of Spotted Knapweed and other knapweeds should follow provincial BMPs (Sherman and Powell, 2017).
Purple Loosestrife Lythrum salicaria	Purple Loosestrife is present in moist habitats throughout Kilally Meadows ESA but generally at low densities. Higher densities of Purple Loosestrife occur in Vegetation Communities 8 and 13. Loosestrife beetle (*Neogalerucella* spp.) was released in the ESA in order to manage Purple Loosestrife and additional releases were planned for 2019. Management of Purple Loosestrife should follow provincial BMPs (Warne, 2016a).
Scots Pine Pinus sylvestris	Scots Pine is present in the northern portion of the ESA but at low densities owing to continued management by the ESA management team. Scots Pine was originally introduced to North America as a fast-growing tree for reforestation and soil stabilization (Marinich and Powell, 2017). Management of Scots Pine should follow provincial BMPs (Marinich and Powell, 2017).

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3.6 Birds

A full list of bird species documented in Kilally Meadows ESA during field investigations in 2018 can be found in **Appendix B**.

3.6.1 Breeding Birds

Breeding bird surveys were carried out in June and July of 2018. A few additional species were documented outside of the breeding bird survey protocol period but were included on the breeding bird list since there was evidence that they were breeding in the ESA.

A total of 69 bird species were documented in Kilally Meadows ESA in 2018. Of these, ten species were confirmed to be breeding in the ESA. An additional 41 species were determined to be possible or probable breeders in the ESA. The ESA can therefore be said to provide breeding habitat for at least 51 bird species with different life histories and habitat requirements. Kilally Meadows ESA is a popular birdwatching destination in London and there are hundreds of checklists for the ESA on eBird, an online citizen science platform. eBird has records of 179 bird species in the ESA with records dating back to 1972. The number of bird species that use Kilally Meadows ESA for breeding and other life processes is therefore presumed to be at least this many.

3.6.2 Species At-Risk (SAR) Birds

At least three SAR bird species use Kilally Meadows ESA as habitat for breeding and other life processes. In addition to SAR, 25 bird species considered to be Conservation Priority in Middlesex County by Bird Studies Canada were documented in the ESA (Couturier, 1999).

3.6.3 Migratory Birds

A total of 18 bird species were observed in the ESA during migration in spring and fall but were not observed during breeding bird surveys. Although these birds do not breed in Kilally Meadows ESA, the ESA provides important stopover habitat for them as a place to feed or rest during migration to their breeding and wintering grounds.

3.7 Reptiles and Amphibians

Amphibian breeding surveys in the spring of 2018 documented three species of amphibians breeding in Kilally Meadows ESA: American Toad (*Anaxyrus americanus*), Spring Peeper (*Pseudacris crucifer*), and Western Chorus Frog (*Pseudacris triseriata*). An additional species, Northern Leopard Frog (*Lithobates pipiens*) was observed incidentally during later site visits but was not heard calling during breeding surveys.

Eastern Gartersnake (*Thamnophis sirtalis sirtalis*) and DeKay's Brownsnake (*Storeria dekayi*) were observed incidentally during field investigations. A Spiny Softshell and Northern Map Turtle were also incidentally observed, both of which are considered Species at Risk in Ontario. A list of reptiles and amphibians documented in the ESA can be found in **Appendix B**.

3.8 Incidental Observations / Other Wildlife

Some common mammal species were observed in Kilally Meadows ESA, such as White-tailed Deer (*Odocoileus virginianus*), Northern Raccoon (*Procyon lotor*), and Eastern Gray Squirrel (*Sciurus carolinensis)*. A variety of insects and arthropods were documented in the ESA, including 14 butterfly species. Two of these, Monarch and Hackberry Emperor (*Asterocampa celtis*), are species of conservation concern. There is a high probability that Tawny Emperor (*Asterocampa clyton*), another rare butterfly and obligate feeder of hackberries, is also present in Kilally Meadows ESA, but it was not observed during field investigations. A list of wildlife species observed in Kilally Meadows ESA can be found in **Appendix B**.

3.9 Significant Wildlife Habitat

SWH in Kilally Meadows ESA was evaluated using the criteria in the Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (MNRF, 2015). The following sections detail the SWH types that were identified in the ESA. A review of SWH based on provincial criteria can be found in **Appendix C**. Only SWH that was confirmed to be present is illustrated on **Map 3** in **Appendix A**.

3.9.1 Seasonal Concentration Areas of Animals

Waterfowl Stopover and Staging Areas- Aquatic (candidate)

The Thames River could be an important stopover area for waterfowl since many of the indicator species for this SWH have been reported during migration on eBird. Detailed migrant waterfowl surveys were not conducted for the purposes of the ERP, so the Thames River has been identified as a candidate waterfowl stopover and staging area.

Shorebird Migratory Stopover Areas (candidate)

It is difficult to rule out the presence of this SWH type since indicator species were observed by Parsons and have been reported on eBird. However, it is extremely unlikely that the requisite number of shorebirds stopover in Kilally Meadows ESA during migration. If present, shorebird migratory stopover areas would be located along the Thames River.

Raptor Wintering Area (candidate)

The combination of forest and open country communities in Kilally Meadows ESA, and winter reports of several indicator species from eBird and the Friends of Kilally Meadows, mean that the ESA could be a candidate raptor wintering area. Detailed winter raptor surveys would be needed to confirm whether this SWH is present.

Bat Maternity Colony (candidate)

Trees in the ESA may provide maternity habitat for bats and support at densities suitable for a maternity colony. A snag density survey and acoustic surveys for bats could be completed in the ESA to confirm the presence of bat SWH.

3.9.2 Movement Corridors

Amphibian Movement Corridors

Spring Peepers, Western Chorus Frogs, and other amphibians are likely to move from the wetland in polygon 13 into surrounding forest communities after the breeding season. Any movement corridors between wetland and forest communities used by amphibians could be significant.

3.9.3 Rare Vegetation Communities

As discussed in **Section 3.5.2**, fresh-moist tallgrass prairie and fresh-moist tallgrass savannah, both rare vegetation communities, are present in Kilally Meadows ESA.

Savannah

There is one tallgrass savannah ecosite in Kilally Meadows ESA and the presence of large bur oaks and prairie grasses in other vegetation communities suggests that tallgrass savannahs were once more abundant in the ESA.

Tallgrass Prairie

There is one tallgrass prairie ecosite in Kilally Meadows ESA and the presence of prairie grasses (e.g. Indian Grass, Big Bluestem, Little Bluestem, Switchgrass) and other prairie species elsewhere in the ESA suggests that tallgrass prairies were once more abundant in the ESA as well.

3.9.4 Specialized Habitat for Wildlife

Amphibian Breeding Habitat - Woodland

MNRF distinguishes between woodland type and wetland type amphibian breeding habitat. Amphibian breeding surveys conducted in the spring of 2018 identified significant amphibian

breeding habitat, woodland type, in Kilally Meadows ESA. The willow mineral thicket swamp in polygon 13 was found to contain over 20 calling individuals of Spring Peeper and Western Chorus Frog. This feature, and forest communities within 230 m, is therefore SWH.

Amphibian Breeding Habitat – Wetland (candidate)

Wetland type significant amphibian breeding habitat was not identified in the ESA. However, several other locations contain breeding amphibians and, though not technically significant at a provincial level, are still important wildlife habitat in the ESA.

3.9.5 Habitat for Species of Conservation Concern

Shrub / Early Successional Bird Breeding Habitat (candidate)

Breeding bird surveys identified two common shrub/early successional bird species – Field Sparrow (*Spizella pusilla*) and Willow Flycatcher (*Empidonax traillii*) – in thicket communities in the ESA. However, none of the uncommon indicator species were observed and thicket type communities in the study area are therefore only candidate shrub/early successional bird breeding habitat.

Habitat for Rare Plant and Wildlife Species

Table 8 lists the rare and special concern wildlife species in Kilally Meadows ESA, a list of the rare plant species can be found in **Table 6** in **Section 3.5.2**. Rare species constitute any plant or wildlife species with an S-rank of 1-3 as identified by the Natural Heritage Information Centre (NHIC) or identified as "Rare" for Middlesex Country on the "List of the Vascular Plants of Ontario's Carolinian Zone (Ecoregion 7E)" (Oldham, 2017). Habitat for these species is discussed in the sections above.

Table 8. Species of Conservation Concern in Kilally Meadows ESA

Species	Status[1]	Habitat	Notes
Barn Swallow *Hirundo rustica*	SARA – THR ESA – SC NHIC – S4B	Anthropogenic structures	Downlisted: May 5th, 2021 (Endangered Species Act)
Eastern Wood-pewee *Contopus virens*	SARA – SC ESA – SC NHIC –S4B	FOD7, FOD8-1	Included in ERP
Green Dragon *Arisaema dracontium*	SARA – n/a ESA – SC NHIC – S3		Added based on verified 2019 observation

Species	Status[1]	Habitat	Notes
Hackberry Emperor *Asterocampa celtis*	SARA – n/a ESA – n/a NHIC – S3	FOD7 CUM1/CUT1	
Monarch *Danaus plexippus*	SARA – END ESA – SC NHIC – S2N, S4B	CUM1/CUT1	Uplisted: Dec. 8th 2023 (Species at Risk Act)
Northern Map Turtle *Graptemys geographica*	SARA – SC ESA – SC NHIC – S3	FOD8-1 / Bank of Thames	Included in field investigation data
Western Chorus Frog *Pseudacris triseriata*	SARA – THR ESA – n/a NHIC – S4		Included in ERP
Wood Thrush *Hylocichla mustelina*	SARA –THR ESA – SC NHIC – S4B	FOD7, FOD8-1	Included in ERP

[1]SARA: Status on Schedule 1 of the SARA. (2002) (END – Endangered, THR – Threatened, SC – Special Concern); ESA: Status on the provincial *Endangered Species Act* (2007) (END – Endangered, THR – Threatened, SC – Special Concern); NHIC: provincial conservation status (S2 – Imperiled, S3 – Vulnerable, S4 – Apparently Secure, B – breeding, N – Nesting).

3.10 Species at Risk

Table 9 lists the Species at Risk observed in Kilally Meadows ESA. All these species are listed as Endangered or Threatened under the provincial *Endangered Species Act*, 2007. In addition to the SAR species observed during the 2018 field investigations (**Appendix B**) completed for the ERP, any changes in SAR status have been noted in the records below.

Table 9. Species at Risk in Kilally Meadows ESA

Species	Status	Habitat	Notes
Butternut *Juglans cinerea*	SARA –END ESA –END NHIC –S2?	CUM1	Included in ERP
Spiny Softshell *Apalone spinifera*	SARA – END ESA – END NHIC – S2	FOD8-1 / Bank of Thames	Included in field investigation data

Vegetation communities where Species at Risk and other species of conservation concern occur will be a priority for restoration activities to maintain long-term habitat for these species. To protect these sensitive species, the specific location of SAR or rare species and their habitat have not been mapped. However, the presence of these species has been incorporated into restoration priorities as outlined in **Section 5.3**.

3.11 Trails and Disturbances

Feature and trail disturbances were not evaluated during the 2018 field investigations conducted for the ERP for Kilally Meadows ESA. Evaluation of the existing trails and associated disturbances is addressed through the Existing Trail Compatibility Review in **Section 5.4.2** and the Trail Management recommendations in **Section 5.4**. Ongoing maintenance of trails and disturbances is incorporated into the ESA adaptive management and monitoring framework outlined in **Section 6.0**.

4.0 ESA Boundary Delineation and Review

4.1 Existing ESA Boundary Refinement

A primary focus for this study was to refine the boundaries of the ESA in accordance with the Boundary Delineation Guidelines in Section 4.8 of City's *Environmental Management Guidelines* (2025).

ESAs typically contain a complex of Wetlands, Woodlands, SWH, and / or Significant Valleylands and are delineated based on the features that they contain (EMG, Section 4.6). The 2018 field investigations and review of available mapping and imagery was utilized to review and update the boundaries of the ESA where appropriate.

The existing ESA boundary, as provided by the City and found on Map 5 of *The London Plan* (2016), encompasses 119 ha of public land (**Map 4**, **Appendix A**). The revised ESA boundary (also see **Map 4**) includes much of the excluded contiguous natural features and is more representative of ecological boundaries. The revised boundary increases the Kilally Meadows ESA area to approximately 158 ha.

The following guideline criteria were applied in the revised delineation of ESA boundaries for Kilally Meadows ESA:

- **Guideline 1:** All contiguous Species at Risk (SAR) habitat and Significant Wildlife Habitat (SWH) must be included within the ESA boundary and will also typically, once confirmed, also need to be included in the natural feature boundary.

- **Guideline 2:** Swamps, marshes, thicket swamps, or other untreed wetland communities and their associated Critical Function Zones contiguous with the wetland feature must be included within the ESA and / or NHS boundary in accordance with the criteria provided. To be included in the ESA and / or NHS boundary, the wetland communities must meet at least one of the following criteria:

  a) The wetland strengthens a linkage between natural features by filling in a bay or connecting two or more natural features or is contiguous with another natural feature;

- **Guideline 3:** Projections of naturalized vegetation less than thirty meters (30 m) wide that extend from the main body of the woodland feature:

  a) must be included within the boundary if the projection includes a wooded ravine or valley with untreed or successional habitat below the top-of-slope; and

  b) must be included within the boundary if the projection provides linkage within the landscape

- **Guideline 6:** Cultural meadows must be included in an ESA if they meet one (1) of the following criteria:

  a) a portion of meadow habitat surrounds a feature on one or more sides, and provides improved ecological function to the established NHS feature by its inclusion;

  b) strengthen internal linkages between NHS features by filling in "bays";

  c) connect one or more NHS features to a watercourse; or

  d) connect two or more NHS features to each other (inset d of Figure 4.7); or,

  e) are below the top-of-stable-slope in a stream corridor or ravine

- **Guideline 8:** Existing land uses within or adjacent to a confirmed NHS feature may be included in an ESA and/or NHS boundary subject to the following boundary considerations:

  a) Existing heavily managed or manicured features that are surrounded on at least three sides by a NHS feature are included in the ESA boundary if they are less than one hectare (1 ha) in total area (Figure 4.9). Such features include, but are not limited to agricultural croplands, active pasture, golf courses, lawns, ornamental treed lots, gardens, nurseries, orchards, and Christmas tree plantations. Subsequent abandonment or potential for rehabilitation of patches larger than one hectare (1 ha) may qualify such areas for inclusion in the patch; and,

b) Existing residential building envelopes and institutional building envelopes surrounded on at least three sides by a NHS feature are not included in the ESA. Building envelopes and access routes of existing structures within the patch must be determined on a site-specific basis.

4.2 Natural Heritage Features

The natural heritage features and areas found in London include Environmentally Significant Areas, Provincially Significant Wetlands and Wetlands, Fish Habitat, Significant Woodlands and Woodlands, Significant Valleylands, the habitat of Endangered and Threatened species, Significant Wildlife Habitat, and Areas of Natural and Scientific Interest, which are all important for their environmental and social values as a legacy of the natural landscapes of the City of London and the surrounding area (LP_1229).

As mentioned in **Section 1.1**, ESAs are often represented by a complex of natural heritage features (LP_1367). The City's Natural Heritage System, including ESAs, is shown on Map 5 of *The London Plan* (LP_1298); however, not all components of the Natural Heritage System are necessarily included in the mapping of ESAs (LP_1367). Within Kilally Meadows ESA, only features that are regulated by provincial requirements and those that are contiguous, extending beyond the ESA boundary are identified on Map 5 (LP_1229).

While all natural heritage features within Environmentally Significant Areas are protected by their inclusion in the ESA boundary and Green Space Place Type, delineating and mapping the boundaries of features not shown on Map 5 is an additional measure to ensure their protection and assist in their management (LP_1367). Understanding the natural heritage features present within an ESA allows for ecological buffers to be correctly applied should development be proposed within their proximity. The required minimum ecological buffer width for an ESA is based on the associated component of the Natural Heritage System, with feature specific buffers outlined in Table 5.2 of the EMG.

4.2.1 Delineating Natural Heritage Features

The natural heritage features within Kilally Meadows ESA, as shown on **Map 8** in **Appendix A**, were delineated based on the vegetation communities surveyed in 2018 (see **Section 2.2.5.1**) and the application of the *Environmental Management Guidelines* (2025) and the Environmental Policies of *The London Plan*. **Table 10** summarizes the results of the natural heritage feature delineation for each ELC polygon including rationale and policy support for each designation.

Table 10. Natural Heritage Features

Polygon	ELC Community	Natural Heritage Feature / Area	Rationale	Policy Reference
1, 20, 31, 33, 40, 49	FOD7	Significant Woodland	• One or more hydrological features located within or contiguous with the woodland patch • 1 rare plant (S1-S3) species or 4 regionally rare plant species present • Treed vegetation community that contains greater than 25% tree cover	• Criterion 1.1 A) - EMG Appendix D[1] • Criterion 5.1 C) – EMG Appendix D[1] • EMG Section 8.0[2]
2	SWT2-2	Unevaluated Wetland	• Identified wetland ELC Community Series (swamp)	• EMG Section 3.3[3]
5	FOD7	Significant Woodland and Significant Wildlife Habitat	• 1 rare plant (S1-S3) species or 4 regionally rare plant species present • Treed vegetation community that contains greater than 25% tree cover • Significant Wildlife Habitat (Amphibian Breeding Habitat - woodland) present or previously identified.	• Criterion 5.1 C) – EMG Appendix D • EMG Section 8.0 • SWH Section 1.2[4]
6	FOD7-3	Significant Woodland and Significant Wildlife Habitat	• 1 rare plant (S1-S3) species or 4 regionally rare plant species present • Treed vegetation community that contains greater than 25% tree cover	• Criterion 5.1 C) – EMG Appendix D • EMG Section 8.0

Polygon	ELC Community	Natural Heritage Feature / Area	Rationale	Policy Reference
			• Significant Wildlife Habitat (Amphibian Breeding Habitat - woodland) present or previously identified.	• SWH Section 1.2
7	FOD8-1	Significant Woodland and Significant Wildlife Habitat	• One or more hydrological features located within or contiguous with the woodland patch	• Criterion 1.1 A) – EMG Appendix D
			• 1 rare plant (S1-S3) species or 4 regionally rare plant species present	• Criterion 5.1 C) – EMG Appendix D
			• Treed vegetation community that contains greater than 25% tree cover	• EMG Section 8.0
			• Significant wildlife habitat (Amphibian Breeding Habitat - woodland) present or previously identified.	• SWH Section 1.2
9	FOD7	Significant Woodland and Significant Wildlife Habitat	• One or more hydrological features located within or contiguous with the woodland patch	• Criterion 1.1 A) - EMG Appendix D
			• Significant wildlife habitat (Amphibian Breeding Habitat - woodland) present or previously identified.	• SWH Section 1.2
10	SWT2	Unevaluated Wetland	• Identified wetland ELC Community Series (swamp)	• EMG Section 3.3
11	SWD4-1	Unevaluated Wetland,	• Identified wetland ELC Community Series (swamp)	• EMG Section 3.3

Polygon	ELC Community	Natural Heritage Feature / Area	Rationale	Policy Reference
		Significant Woodland and Significant Wildlife Habitat	• Significant wildlife habitat (Amphibian Breeding Habitat - woodland) present or previously identified. • Treed vegetation community that contains greater than 25% tree cover • One or more hydrological features located within or contiguous with the woodland patch	• SWH Section 1.2 • EMG Section 8.0 • Criterion 1.1 A) – EMG Appendix D
13	SWT2-2	Unevaluated Wetland	• Identified wetland ELC community series (swamp)	• EMG Section 3.3
14, 17	SWT2	Unevaluated Wetland	• Identified wetland ELC community series (swamp)	• EMG Section 3.3
16	TPO2-1	Significant Wildlife Habitat	• Rare Vegetation Community: Tallgrass prairies are extremely rare habitats in Ontario	• SWH Section 1.2
18	SWT2-5	Unevaluated Wetland	• Identified wetland ELC community series (swamp)	• EMG Section 3.3
22, 26, 29, 30, 46, 47	FOD8-1	Significant Woodland	• One or more hydrological features located within or contiguous with the woodland patch • 1 rare plant (S1-S3) species or 4 regionally rare plant species present	• Criterion 1.1 A) – EMG Appendix D • Criterion 5.1 C) – EMG Appendix D

Polygon	ELC Community	Natural Heritage Feature / Area	Rationale	Policy Reference
			• Treed vegetation community that contains greater than 25% tree cover	• EMG Section 8.0
23	SWD4	Unevaluated Wetland and Significant Woodland	• Identified wetland ELC community series (swamp) • Treed vegetation community that contains greater than 25% tree cover • One or more hydrological features located within or contiguous with the woodland patch	• EMG Section 3.3 • EMG Section 8.0 • Criterion 1.1 A) – EMG Appendix D
24	MAM2-10	Unevaluated Wetland	• Identified wetland ELC community series (marsh)	• EMG Section 3.3
27	TPS2/CUT1	Significant Wildlife Habitat	• Rare Vegetation Community: Savannahs are extremely rare habitats in Ontario	• SWH Section 1.2
28, 41	MAM2-2	Unevaluated Wetland	• Identified wetland ELC community series (marsh)	• EMG Section 3.3
29	FOD8-1	Significant Woodland and Endangered / Threatened Species Habitat	• One or more hydrological features located within or contiguous with the woodland patch • 1 rare plant (S1-S3) species or 4 regionally rare plant species present • Treed vegetation community that contains greater than 25% tree cover	• Criterion 1.1 A) – EMG Appendix D • Criterion 5.1 C) – EMG Appendix D • EMG Section 8.0

Polygon	ELC Community	Natural Heritage Feature / Area	Rationale	Policy Reference
			• Habitat of Endangered and/or Threatened species present or previously identified	• O.Reg. 230/08[5]
35	CUS1	Significant Woodland	• One or more hydrological features located within or contiguous with the woodland patch • Treed vegetation community that contains greater than 25% tree cover	• Criterion 1.1 A) - EMG Appendix D • EMG Section 8.0
36	MAS2-8	Unevaluated Wetland	• Identified wetland ELC community series (marsh)	• EMG Section 3.3
43	FOD7-5	Significant Woodland	• One or more hydrological features located within or contiguous with the woodland patch • 1 rare plant (S1-S3) species or 4 regionally rare plant species present • Treed vegetation community that contains greater than 25% tree cover	• Criterion 1.1 A) - EMG Appendix D • Criterion 5.1 C) – EMG Appendix D • EMG Section 8.0
44	FOD7-3	Significant Woodland	• One or more hydrological features located within or contiguous with the woodland patch • 1 rare plant (S1-S3) species or 4 regionally rare plant species present	• Criterion 1.1 A) - EMG Appendix D • Criterion 5.1 C) – EMG Appendix D

Polygon	ELC Community	Natural Heritage Feature / Area	Rationale	Policy Reference
			• Treed vegetation community that contains greater than 25% tree cover	• EMG Section 8.0
45	CUM1	Endangered / Threatened Species Habitat	• Habitat of Endangered and/or Threatened species present or previously identified	• O.Reg. 230/08

[1]Appendix D: Woodland Evaluation Form, *Environmental Management Guidelines,* 2025

[2] Section 8.0: Glossary of Terms, "woodland feature", Environmental Management Guidelines, 2025

[3] Section 3.3: Evaluation of Significance and Ecological Function – Provincially Significant Wetlands, Wetlands and Unevaluated Wetlands, *Environmental Management Guidelines,* 2025

[4] Section 1.2.1: Rare Vegetation Communities or Specialized Habitat for Wildlife, *Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E*, 2015

[5] Ontario Regulation 230/08: Species at Risk in Ontario List, *Endangered Species Act,* 2007

5.0 Environmental Management Recommendations

Following the Life Science Inventory of the ESA and refinement of the ESA boundaries, the data collected was utilized to map the ESA into management zones and applicable overlay zones were applied. Recommendations pertaining to restoration and trail management are provided to aid in the maintenance of natural features and functions and aim to improve them through the control of invasive species, restore where appropriate, and manage visitor related impacts. The recommendations provided are intended to be carried forward to the Phase II CMP and implemented to improve and maintain the ecological integrity of Kilally Meadows ESA.

5.1 Management Zones

Management zones are established based on the type of vegetation communities present in an ecosystem and delineated following the *Guidelines for Management Zones and Trail in ESAs* (City of London, 2016). Management zones are the foundation of the ESA management strategy and result in the protection of more ecologically sensitive features by directing use to

areas identified as less ecologically sensitive. The following management zones were identified in Kilally Meadows ESA and their locations are displayed on **Map 5** in **Appendix A**:

- **Nature Reserve Zone**: These areas require a higher level of protection to preserve the ecological integrity of the ESA and represent natural vegetation communities. This zone is delineated using Ecological Land Classification (Lee et al., 1998) to identify vegetation communities that are the result of natural processes. The majority of an ESA is anticipated to be identified as a Nature Reserve Zone.
- **Natural Environment Zone**: These areas contain cultural vegetation communities that result from, or are maintained by, existing or previous cultural or anthropogenic disturbances. These areas often contain a large proportion of non-native species. These communities include plantations, cultural meadows, cultural thickets, cultural woodlands, and cultural savannahs, as well as manicured areas such as mowed lawn or hedgerows.

5.2 Overlay Zones

Following the establishment of management zones, where applicable, various overlay zones can be applied to the area based on existing and future land use priorities. Overlay zones offer further direction for the management of the associated ESA lands and can include Utility, Restoration, and Trail Review Overlay zones.

5.2.1 Utility Overlay

The Utility Overlay is introduced where an existing condition such as a utility site or corridor (e.g., hydro transmission lines, gas or water pipeline, railroad lines, sanitary sewer) or other servicing infrastructure or facilities (e.g., sanitary sewer pumping station or stormwater management facility), is present within the ESA and may preclude restoration to the original ecological condition (City of London, 2016).

Utilities infrastructure in Kilally Meadows ESA includes sanitary sewers, storm sewers, transmission lines, and an oil pipeline (see **Map 1** in **Appendix A**). The right of way (ROW) of the transmission line, oil pipeline, and sanitary sewers that enter the ESA constitute the Utility Overlay. The ROW for these utilities varies from 4 m to 8 m in width.

The Utility Overlay recognizes that restoration of these ROWs to natural conditions may not be possible due to ongoing maintenance of utility infrastructure. However, land within the Utility Overlay can be managed to support overall ecological integrity within the ESA. For example,

invasive species should be managed within Utility Overlays if they threaten the ecological integrity of surrounding habitats.

5.2.2 Restoration Overlay

Restoration Overlays highlight areas within the ESA that require active ecological restoration or special management to restore or improve ecological conditions. The intent of a Restoration Overlay is to:

1. Maintain or restore the indicator feature(s) of the underlying management zone, while providing opportunities for community-based stewardship activities and education.

2. Offer an opportunity to study the recovery of natural ecosystems that have been modified by human disturbances from the past and present and, to facilitate public education, appreciation and stewardship. (City of London, 2016)

For the purposes of the CMP, Restoration Overlays refer to polygons within Kilally Meadows ESA where ecological restoration activities should be conducted. Restoration activities may include habitat creation or enhancement, invasive species management, native vegetative plantings, and/or prescribed burns. Details on the development and prioritization of Restoration Overlays and activities can be found in **Section 5.3**.

5.2.3 Trail Review Overlay

The Trail Review Overlay is to be used as part of trail planning and review. The overlay is to be applied to areas where existing trails are located within a significant ecological feature and further review is required to determine the appropriate resolution if the existing trail is determined to be incompatible with a certain species and/or habitat (City of London, 2016). The Existing Trail Compatibility Review for Kilally Meadows ESA can be found in **Section 5.4.2**.

5.3 Restoration

Ecological restoration broadly refers to improving the integrity and function of a degraded, damaged, or destroyed ecosystem through active management. The Restoration Overlays developed for Kilally Meadows ESA, defined in **Section 5.2.2**, identify areas with unique ecological restoration objectives that could be achieved, with funding and direction from the City, by the ESA management team, community volunteers, and/or others.

5.3.1 Developing Restoration Overlays

The Restoration Overlays for Kilally Meadows ESA were developed with consideration for the following attributes:

- invasive species presence, type(s), and density;
- areas of human disturbance;
- target vegetation community for restoration;
- presence of Significant Wildlife Habitat;
- presence of rare vegetation communities;
- presence of habitat of Species at Risk, regionally rare species or species of conservation concern.

5.3.2 Identifying Restoration Priorities and Timelines

Priorities for management activities in Restoration Overlays in Kilally Meadows ESA were developed with the following principles in mind:

- Restoration and enhancement of habitat for SAR and species of conservation concern is a priority.
- SWH and rare vegetation communities are significant within the City and their restoration and enhancement will be a priority.
- Maintaining and/or increasing native species richness of plants and wildlife will be a primary restoration objective.
- Areas with low densities of invasive species should be prioritized for restoration since they present opportunities for the greatest ecological improvement with the lowest cost and effort.
- Areas with high densities of invasive species will have lower priority for restoration since they will require more funding, resources, and time to successfully remove invasive species and reintroduce native species.

In order to set restoration priorities, a scoring system was developed based on ecological attributes and vegetation communities were scored based on these attributes (See **Table 11**, below). Vegetation communities with higher scores were given the highest restoration priority, as follows:

- Score of 7 or higher: Priority 1 (High)
- Score of 4 to 6: Priority 2 (Medium)
- Score of 0 to 3: Priority 3 (Low)

Table 11. Attributes and scoring system for determining restoration priority

Attribute*	Score
Habitat for SAR, species of conservation concern, or regionally rare species	2 per species

Attribute*	Score
Significant Wildlife Habitat	2 per SWH type
High density of native species (>50% native species cover)	2
Little to no buckthorn (<5% buckthorn cover)	2
Low density of buckthorn (5-50% buckthorn cover)	1
High density of buckthorn (>50% buckthorn cover)	0
Little to no Dog-strangling Vine (>5% Dog-strangling Vine cover)	2
Low density of Dog-strangling Vine (5-50% Dog-strangling Vine cover)	1
High density of Dog-strangling Vine (>50% Dog-strangling Vine cover)	0
Little to no other invasives (<5% other invasive cover)	2
Low density of other invasives (5-50% other invasive cover)	1
High density of other invasives (>50% other invasive cover)	0

*Scoring for the percentage of invasive species cover and the status of SAR, species of conservation concern, and rare species is based on 2019 field study data. Restoration priorities and overlays do not reflect any recent species status updates or changes to invasive species coverage. Onsite conditions should be confirmed prior to the implementation of any restoration activities.

The following priority levels were assigned to each Restoration Overlay:

- Priority 1 (High),
- Priority 2 (Medium), and
- Priority 3 (Low).

These priorities can be interpreted as reflecting the timelines and effort to be applied in each Restoration Overlay. However, it should be noted that invasive species management has been ongoing in Kilally Meadows ESA for several decades and is already in progress in the following Restoration Overlays: RO2a, RO2b, RO2c, RO2d, RO2e, RO3a, RO3b, RO4b, RO4c, RO4d, and RO4e.

Table 12. Restoration Overlays and associated restoration activities in Kilally Meadows ESA

ID	Area (ha)	Description	Restoration Activities	Priority
RO1a	3.17	Wetland restoration; low density buckthorn; low density Dog-strangling Vine; low density other invasives	Remove small amounts of buckthorn and other invasives. Use Best Management Practices (BMPs) for buckthorn management (Anderson, 2012a).	1

ID	Area (ha)	Description	Restoration Activities	Priority
		(polygons 2, 13, 24, 28, 36)		
RO1b	1.68	Wetland restoration; low density buckthorn; low density Dog-strangling Vine; high density invasive willows (polygon 11)	Remove invasive White Willow and Chinese Willow. Plant live willow stakes consisting of native willow species.	2
RO1c	3.06	Wetland restoration; high density buckthorn; low density Dog-strangling Vine; low density other invasives (polygons 10, 14, 17, 18, 23)	Remove dense thickets of buckthorn. Use BMPs for buckthorn management (Anderson, 2012a).	2
RO2a	4.05	Prairie/meadow restoration; low density buckthorn; low density Dog-strangling Vine; low density other invasives (polygons 16, 21, 48)	Remove small amounts of buckthorn, Autumn Olive and other invasives. Use BMPs for buckthorn management (Anderson, 2012a). Plant prairie grass and forb seeds. Consider controlled burn following invasive species removal in order to promote regeneration of prairie species.	1
RO2b	8.16	Prairie/meadow restoration; low density buckthorn; low density Dog-strangling Vine; high density other invasives (polygons 3, 8, 32, 37, 45)	Remove Creeping Thistle, Eastern Hedge Bedstraw and cool season grasses. Controlled burn could be effective in these areas but should be followed by seeding native prairie grasses and forbs.	2

ID	Area (ha)	Description	Restoration Activities	Priority
RO2c	1.84	Prairie/meadow restoration; high density buckthorn; low density Dog-strangling Vine; low density other invasives (polygon 28)	Remove dense thickets of buckthorn. Use BMPs for buckthorn management (Anderson, 2012a). Plant prairie grass and forb seeds. Consider controlled burn following invasive species removal in order to promote regeneration of prairie species.	2
RO2d	7.71	Prairie/meadow restoration; high density buckthorn; high density Dog-strangling Vine; low density other invasives (polygons 15, 19)	Remove dense thickets of Buckthorn and Dog-strangling Vine. Use BMPs for Buckthorn and Dog-strangling Vine. management (Anderson, 2012a, b). Remove Autumn Olive following provincial BMPs (Warne, 2018). Consider timing herbicide application to avoid flowering time of rare plant species (before June 15). Or use hand pulling and mechanical methods to remove invasives in proximity to rare plants. Plant prairie grass and forb seeds. Consider controlled burn following invasive species removal in order to promote regeneration of prairie species.	1
RO2e	2.18	Prairie/meadow restoration; high density buckthorn; high density Dog-strangling Vine; high density other invasives (polygon 25)	Remove dense patches of buckthorn, Dog-strangling Vine, Eastern Hedge Bedstraw, and cool season grasses. Use BMPs for Buckthorn and Dog-strangling Vine management (Anderson, 2012a, b). Consider timing herbicide application to avoid flowering time of rare plant species (before June 15). Or use hand	3

ID	Area (ha)	Description	Restoration Activities	Priority
			pulling and mechanical methods to remove invasives in proximity to rare plants. Plant prairie grass and forb seeds. Consider controlled burn following invasive species removal in order to promote regeneration of prairie species.	
RO3a		Savannah restoration; low density buckthorn; low density Dog-strangling Vine; high density other invasives (polygon 35)	Remove invasive grasses and forbs and small amounts of buckthorn. Controlled burn could be effective in these areas but should be followed by seeding native prairie grasses and forbs.	2
RO3b	2.60	Savannah restoration; high density buckthorn; high density Dog-strangling Vine; low density other invasives (polygon 27)	Remove dense thickets of buckthorn and Dog-strangling Vine. Use BMPs for buckthorn and Dog-strangling Vine management (Anderson, 2012a, b). Consider timing herbicide application to avoid flowering time of rare plant species (before June 15). Or use hand pulling and mechanical methods to remove invasives in proximity to rare plants. Plant prairie grass and forb seeds. Consider planting medium-large caliper bur oaks to accelerate restoration of savannah community. Consider controlled burn following invasive species removal in order to promote regeneration of prairie species.	1

ID	Area (ha)	Description	Restoration Activities	Priority
RO4a	8.76	Forest restoration; low density buckthorn; low density Dog-Strangling Vine; low density other invasives (polygons 4, 30, 46)	Remove small amounts of buckthorn, Dog-strangling Vine, and other invasives. Use BMPs for buckthorn and Dog-strangling Vine management (Anderson, 2012a, b). Consider planting deciduous trees in open areas to accelerate forest regeneration.	1
RO4b	10.36	Forest restoration; low density buckthorn; low density Dog-strangling Vine; high density other invasives (polygons 26, 31)	Remove dense patches of Goutweed and Creeping Charlie and small amounts of buckthorn and Dog-strangling Vine. Use BMPs for buckthorn and Dog-strangling Vine management (Anderson, 2012a, b). Consider planting native woodland species after invasives have been removed.	2
RO4c	40.29	Forest restoration; high density buckthorn; low density Dog-strangling Vine; low density Other invasives (polygons 1, 5, 7, 9, 12, 22, 39, 40, 42, 43, 47)	Remove dense thickets of buckthorn. Use BMPs for buckthorn management (Anderson, 2012a). Remove small patches of other invasives (e.g. Daylilies, Garlic Mustard). Consider planting native woodland species once invasives have been removed. Consider planting deciduous trees in open areas to accelerate forest regeneration.	2
RO4d	8.87	Forest restoration; high density buckthorn; low density Dog-strangling Vine; high density other invasives (polygons 6, 44)	Remove dense thickets of Buckthorn and other invasives (e.g. White Willow, Garlic Mustard). Use BMPs for buckthorn and Garlic Mustard management (Anderson, 2012a, c).	2

ID	Area (ha)	Description	Restoration Activities	Priority
			Consider planting native woodland species once invasives have been removed. Consider planting deciduous trees in open areas to accelerate forest regeneration.	
RO4e	17.36	Forest restoration; high density buckthorn; high density Dog-strangling Vine; low density other invasives (polygons 20, 29, 33, 34, 49)	Remove dense thickets of buckthorn and Dog-strangling Vine. Use BMPs for buckthorn and Dog-strangling Vine management (Anderson, 2012a, b). Consider planting native woodland species once invasives have been removed. Consider planting deciduous trees in open areas to accelerate forest regeneration.	2

5.3.3 Restoration Recommendations

The following restoration practices are recommended to enhance the ecological form and function of Kilally Meadows ESA. A complete list of areas where restoration work is to be completed as well as details on how this work should be carried out and benefits this will provide can be found in Appendix D. The locations of the restoration areas within this table are shown on **Map 6** in **Appendix A**.

5.3.3.1 Unsanctioned Trail Assessment

Unsanctioned trails, particularly those that are not well designed, have the potential to negatively impact surrounding vegetation communities, especially those located within the Nature Reserve Zones. Unsanctioned trails should be assessed for proper design, location, and associated ecological impact, and areas requiring ecological restoration should be identified.

Several unsanctioned trails were identified in Kilally Meadows ESA during the existing trail compatibility review and shown on **Map 9** in **Appendix A**. Most unsanctioned trails occur within the Natural Environment Zone and from desktop analysis these trails appear to be compatible with the surrounding ecological features, but this conclusion should be confirmed through onsite assessment. Some unsanctioned trails occur within the Nature Reserve Zone, within the Fresh-moist Tallgrass Prairie and the Fresh-moist Savannah communities. Although well-designed trails are considered compatible with these rare communities, given their

unofficial construction, the assessment and potential closure of these unsanctioned trails should be prioritized.

5.3.3.2 Invasive Species Management

Invasive plant species are present in several areas within Kilally Meadows ESA. Invasive species that were identified and recommended for management include buckthorns, Dog-strangling Vine, Autumn Olive, Creeping Thistle, Eastern Hedge Bedstraw, cool season grasses, White Willow, Chinese Willow, Gout Weed, Creeping Charlie, daylilies, and Garlic Mustard. These species were found to be abundant in certain areas, many of which have been identified as priority species within the *London Invasive Plan Management Strategy* (LIPMS).

It is recommended that invasive species be removed before they spread further throughout the Kilally Meadows ESA and surrounding environments. Removal of invasive plants should be completed on a species-by-species basis following the BMPs developed by the Ontario Invasive Plant Council (OIPC) and consistent with the Council-approved LIPMS. In addition to removing invasive species, it is necessary to ensure that further invasive species are not introduced into Kilally Meadows ESA. To prevent this, it is recommended that the Clean Equipment Protocol for Industry (Halloran et al., 2013) be applied for any equipment entering the ESA.

5.3.3.3 Controlled Burns

Controlled burns will be an important tool for restoring tallgrass prairie communities in Kilally Meadows ESA. Burns are recommended for communities which retain propagules of tallgrass prairie species in their seedbanks. Manual removal of shrubby vegetation may be necessary in some communities prior to undertaking a burn.

Controlled burns may not need to be conducted across entire polygons but could be staged, for example, by burning one hectare each year. Note that controlled burns should be conducted only by licensed and experienced professionals. The controlled burn will be completed in consultation with First Nations.

Controlled burns should be conducted in tallgrass prairie communities when forb and/or cool season grass cover starts to exceed prairie grass cover (i.e., exceeds 50%). Communities that are currently dominated by prairie grasses (e.g., polygons 10, 20) do not currently require a burn but the relative proportions of these types of vegetation cover should be monitored over time.

5.3.3.4 Waste Removal

The removal of waste that has been dumped in the Kilally Meadows ESA is one of the first restoration techniques that can be put into practice to improve habitat for wildlife and plant species. 'No Dumping' signs and dense plantings should be provided in target areas to discourage foot traffic and unauthorized dumping. Waste and litter removal should be completed prior to the implementation of other restoration activities.

5.3.3.5 Native Vegetation Plantings

Native vegetation plantings are an excellent way to enhance and restore degraded environments impacted by invasive species or human disturbance. Native plantings can be used to provide higher quality wildlife habitat, limit the effects of erosion, and prevent the establishment of invasive species in natural areas. The planting of prickly or thorny species can be used in areas susceptible to unauthorized pedestrian traffic and waste dumping, as these plants act as a natural deterrent for both humans and pets and can assist in limiting access to sensitive areas. Native vegetation planting should commence following the removal of waste and invasive species.

5.3.3.6 Monitoring

To ensure the success of restoration and enhancement projects, it is necessary to regularly assess the areas where these measures have been implemented. Monitoring should be completed on an annual basis and should focus on areas where invasive plant species have been removed and where restorative plantings have been completed.

5.4 Trail Management

The CMP will review the results of the Phase I study, consultation with the City, and public to determine a trail system that is sustainable and addresses the priority of maintaining ecological integrity of the ESA. Trail design, as identified in the *Guidelines for Management Zones and Trail in ESAs* (City of London, 2016), includes:

- ecological sustainability to avoid impacts to ecological features and functions,
- physical sustainability of the trails and/or structures so they retain their form and function over time and can withstand the natural forces acting on them,
- stewardship by the greater community to foster a sense of individual and collective responsibility for the protection of the ESA, and
- how the proposed Sustainable Trail Concept Plan complies with the Guidelines.

To protect the ESA while allowing for appropriate trail use, a Trail Review Overlay can be applied to the existing managed trails within the ESA to assess their compatibility with significant ecological features, as discussed in **Section 5.2.3**.

5.4.1 Trail Hierarchy and Specifications

There are three tiers, or levels of trails and pathways that are permitted within the publicly owned ESAs in the City:

- Level 1: Natural surface or boardwalk, 1.0 – 1.5 m width
- Level 2: Non-erodible firm and stable surface, 1.0 – 2.0 m width
- Level 3: Non-erodible firm and stable surface, 2.0 – 3.0 m width

The surface, structure, width, and permitted uses of each trail varies by level and is determined based on the management zone in which they are located.

As discussed in **Section 5.1**, management zones are designed to protect sensitive ecological features within an ESA by directing access and use to areas of lower sensitivity and that provide greater accessibility and are delineated following the *Guidelines for Management Zones and Trail in ESAs* (City of London, 2016).

5.4.2 Existing Trail Compatibility Review

The existing managed trails are reviewed for compatibility with the ecological features of Kilally Meadows ESA in the context of the *Guidelines for Management Zones and Trails in Environmentally Significant Areas* (City of London, 2016) as described on page 24, Chart 2 and Table 1 of that document. The first step in this review is to determine if there is potential for the existing managed trails to negatively impact the significant ecological features identified in the Life Science Inventory. All significant ecological features are screened with the "Yes / No" question "Does this feature require review for compatibility with trails? Results of this initial screening completed for Killaly Meadows can be found in **Table 13.**

During this evaluation the following questions are considered when providing rationale for the final decision:

- Would a trail designed to be compatible with the underlying landform and/or significant ecological feature(s) harm the feature or its ecological function?
- Would responsible trail use harm the feature or its function?

Table 13. Trail Compatibility Review for Kilally Meadows ESA

Significant Ecological Feature	Trail Compatibility Review Required?	Rationale[1]
Significant Wildlife Habitat[2]		
Seasonal Concentration Areas of Animals		
Waterfowl Stopover and Staging Areas (Aquatic)	No	Trails would not occur in open water where this wildlife habitat would occur.
Shorebird Migratory Stopover Areas	No	Significant shorebird migratory stopover habitat typically occurs along the southern Great Lake shorelines. The large numbers of shorebirds required to evaluate this type of wildlife habitat would generally not be found in the City's ESAs.
Raptor Wintering Area	No	In general, trails do not cause changes (reductions) to vegetation communities or alterations that may reduce prey populations. Raptors roosting within City limits would not likely be sensitive to the limited disturbance that occurs in ESAs in the winter months.
Bat Maternity Colonies *	No	Wildlife trees are retained in ESAs and trees along hiking trails are not routinely inspected for bat habitat. In the unlikely event that a large tree would need to be proactively managed for risk to public safety, a cavity search is completed in advance by qualified personnel to avoid impacts to

Significant Ecological Feature	Trail Compatibility Review Required?	Rationale[1]
		the species. As bats do not generally exhibit site fidelity to any one wildlife tree, trails would not impact bats or this type of wildlife habitat.
Specialized Habitat for Wildlife		
Amphibian Breeding Habitat (wetland and woodland) *	No	Amphibians breeding in water are not anticipated to be impacted by trails and/or trail use. Given that most amphibian breeding occurs at night, when public access to the ESA is prohibited, impacts to this type of wildlife habitat due to trail use are not anticipated.
Animal Movement Corridors and Linkages		
Amphibian Movement Corridors*	No	Trails are not a barrier to connectivity for amphibian species. Most non-salamander species' movement between amphibian habitats is typically random dispersal rather than following a distinct corridor.
Rare Vegetation Communities		
Cliffs and Talus Slopes, Sand Barrens, Alvars, Old Growth Forests, Savannahs and Tallgrass Prairies	No	A well-designed trail would not significantly impact these communities or threaten their continued persistence in the ESA.
Habitat for Species of Conservation Concern[3]		

Significant Ecological Feature	Trail Compatibility Review Required?	Rationale[1]
Shrub/Early Successional Bird Breeding Habitat	No	Trails located in or adjacent to this habitat would not result in habitat loss.
Other Species of Conservation Concern	Yes	Species included in this type of wildlife habitat have a diverse range of requirements and tolerance to disturbance.
Species at Risk[4]		
Threatened or Endangered Species[5]		
Species at Risk (General/Regulated Habitat[5])	Yes	Species and/or habitat included in this type of wildlife habitat have a diverse range of requirements and tolerance to disturbance.

[1] From the Significant Wildlife Habitat Mitigation Support Tool (MNRF, 2014)

[2] As per the most recent version of the MNRF's Ecoregion 7E Criteria Schedules for Significant Wildlife Habitat. At the time of writing this version of the guideline, the latest version was January 2015

[3] Species of Conservation Concern include species designated by the NHIC as SRank S1-S3, provincially designated Special Concern under the Endangered Species Act, 2007 or designated Threatened or Endangered under Schedule 1 of the Species at Risk Act, 2002

[4] Species at Risk are those legally protected as Threatened or Endangered Species under the Ontario Endangered Species Act, 2007

[5] Derived from a General Habitat or Regulated Habitat description or summary. The general habitat is based on the area currently depended on by the species for critical life processes. Regulated habitat is as described in Ontario Regulation 242/08

Please note that the *Guidelines for Management Zones and Trails in Environmentally Significant Area*s takes into account best policy implementation and available scientific data at the time of Council adoption. We acknowledge that the science in these areas may have progressed since 2016. All trail compatibility measures noted with an asterisk (*) were reviewed against the 2016 policy document and may require additional review or consideration to align with current scientific best practices.

To assess trail compatibility with the identified significant ecological features, the Trail Review Overlay is applied. The existing trails within Kilally Meadows ESA were overlaid onto the significant ecological features identified for review (see **Map 3** and **Map 9**, **Appendix A**). It should be noted that not all SAR have been mapped to protect these features in accordance with data sensitivity requirements of Ontario's Natural Heritage Information Centre. The unsanctioned trails included on **Map 9** were not included in the compatibility review.

Significant ecological features that did not overlap with the existing managed trail system were considered compatible. In cases where significant ecological features did overlap with the existing trails, relevant resources were consulted to provide guidance on how trails and/or trail use may impact the feature under review (City of London, 2016).

Based on the results of this review, the following options for managed trails are:

- keep the existing trail, as is;
- keep the existing trail and include design features to preserve ecological integrity;
- realign the trail to avoid the significant ecological feature; or,
- close the trail.

Table 14 details the trail compatibility results for the significant ecological features flagged as requiring review and offers recommendations for future trail management.

Table 14. Trail Compatibility Assessment for Kilally Meadows ESA

Significant Ecological Feature	Is this feature compatible with the existing managed ESA trails?	Rationale	Recommended Action
Significant Wildlife Habitat			
Habitat for Other Species of Conservation Concern			
Great Plains Ladies' tresses	Yes	Encroachment of woody and weedy species, illegal collection of plants, herbicides, and ditch clearing are known threats to Great Plans Ladies tresses. Preserving native species and restoring Tall Grass Prairie ecosites are known recovery strategies, neither of which are incompatible with proper managed trail use (Manitoba Conservation, n.d.).	Close unsanctioned trails
Green Dragon	No	Recreational trails is a listed threat to Green Dragon in the Green Dragon Management Plan (MECP, 2021). Mitigation measures may be required to increase the compatibility of the existing trail with the surrounding ecological features.	Keep the existing trail and include design features to preserve ecological integrity
Hackberry Emperor	Yes	This species is known to be tolerant to human disturbance. A well-designed trail and proper trail use is not likely to	Trail to remain, no further action required

Significant Ecological Feature	Is this feature compatible with the existing managed ESA trails?	Rationale	Recommended Action
		have an impact on this species (Toronto Entomologists' Association, 2002).	
Monarch	Yes	Breeding habitat for the species is considered apparently secure and is found in meadows and woodland edges with concentrations of Milkweed (Asclepias sp.). Existing managed trails are present in these areas; however, Monarch has frequently been observed breeding in heavily disturbed habitats. No impacts are anticipated to occur to Monarch habitat as a result of the existing trail system.	Trails to remain, no further action required
Soft-hairy False Gromwell	Yes	No existing managed trails are present in the area identified as Soft-hairy False Gromwell habitat.	N/A
Striped Cream Violet	Yes	No existing managed trails are present in the area identified as Striped Cream Violet habitat.	N/A
Wood Thrush	Yes	Managed trails are present throughout the forest identified as Wood Thrush habitat. Wood Thrush is relatively tolerant of disturbance and many suitable habitat patches are set	Trails to remain, no further action required

Significant Ecological Feature	Is this feature compatible with the existing managed ESA trails?	Rationale	Recommended Action
		far back from any managed trails. Impacts to Wood Thrush habitat from the existing trail system are not anticipated.	
Species at Risk			
Threatened or Endangered Species			
Butternut	Yes	No existing managed trails are present in the area where Butternut was identified.	N/A
Spiny Softshell Turtle	Yes	Species spends the majority of its time in aquatic habitat and nesting likely occurs on the banks of the Thames River away from existing trails. Habitat is determined to be compatible with existing trails.	Close unsanctioned trails

5.4.2.1 Results

The significant ecological features in the Kilally Meadows ESA have been determined to be generally compatible with all official managed trails. A portion of level 1 trail is located adjacent to a Green Dragon population, known to be sensitive to recreational trails. To increase trail compatibility and preserve the ecological integrity of the Green Dragon population, site-specific trail design features (such as a boardwalk) should be considered as a part of the ESA management plan for the Phase II CMP, where issues are identified.

5.4.3 Issues and Considerations

At this stage, the following issues pertaining to trail use and protection of the ESA's natural heritage features and functions likely require further discussion and consideration. The consultation process with the public and the City may identify additional issues.

5.4.3.1 Close Unmanaged Trails

As identified in **Section 5.3.3**, there are several locations along the managed Killaly Meadows ESA trail network where connections with unmanaged unsanctioned trails occur. The compatibility and potential impact of unsanctioned trails on the surrounding environment should be assessed, and their priority for closure established. If it is determined that unsanctioned trails are to remain open for use, they should be added to the Kilally Meadows ESA trail network and managed accordingly.

5.4.3.2 Trail Condition

Regular trail usage can lead to the deterioration of trail conditions due to foot traffic impact on the trail substrate as well as natural factors such as erosion from surface runoff and drainage through stream channels and gulleys. The location of the trail system within the valley of the Thames River, combined with regular trail use, and the presence of minor watercourses flowing from the table lands down the valley slopes could provide conditions that result in trail erosion throughout the ESA. Areas that are frequently wet or muddy may be bypassed, resulting in the widening of the trail footprint over time. Recommendations for addressing trail conditions are presented in **Section 5.4**.

5.4.3.3 Non-permitted Uses

Non-permitted uses within the City's ESAs are occasionally observed. Such uses include the dumping of refuse, off-leash dog walking, removal of plant material from the ESA, creation and use of fire pits, and construction of lean-to shelters using downed woody material from the forest floor. A reduction in non-permitted uses can be achieved through continued

enforcement via the City's by-laws, stewardship and education initiatives with the surrounding community, and sustainable trail design.

5.4.3.4 ESA Protection, Use and Accessibility

ESAs allow for a variety of community uses and to connect with the City's natural heritage through a well managed and accessible trail system. To meet the needs of community members of all ages and abilities to realize the health benefits of the natural environment, including physical and mental well-being and social interaction, the *Guidelines for Management Zones & Trails in Environmentally Significant Areas* (City of London, 2016) speak to both sustainable trail design to protect the ESA and accessibility to meet AODA requirements.

5.4.4 Sustainable Trail Concepts

The current trail conditions and compatibility are based on the issues noted above. Review and consideration of feedback from the public and City will be established during the Phase II CMP process. **Map 9** displays the existing Phase I sustainable trail concept plan for Kilally Meadows ESA.

5.4.4.1 Improved Trail Surface

Trail erosion due to increased run-off and a failing erosion control structures (e.g., Benson Crescent Dyke) was noted by staff. Addressing underlying structural failings, followed by native vegetative plantings and other natural or engineered erosion control measures may be required. This could include closing eroding trail segments if mitigation measures do not satisfy safety concerns. Areas subject to erosion due to foot traffic and natural processes can be addressed via natural erosion barriers such as strategically placed logs at or near the trail edges. Augmenting the natural trail surface in these areas with woodchips or granular material may also reduce erosion issues.

5.4.4.2 Accessibility

Much of the trail system in Killaly Meadows ESA is within a Nature Reserve Zone, and therefore only Level 1 trails are permitted to provide the maximum protection of the natural system and minimal maintenance requirements. However, the Thames Valley Pathway and a multi-use pathway (both level 3 trails) intersect Nature Reserve Zones within the ESA. Ontario Regulation 191/11 *The Design of Public Spaces Standard*, referenced in the *Guidelines for Management Zones & Trails in Environmentally Significant Areas* (City of London, 2016), acknowledges that there can be exceptional conditions where accessibility needs to be balanced with other concerns, and that where this is the case the City is to adhere to the Standard to the greatest

extent possible. These level 3 trails, although within the Nature Reserve Zone, increase the accessibility and connectivity of the Kilally Meadows ESA trail system. The incorporation of trail design features to help mitigate impacts and preserve the ecological integrity of surrounding features may be required.

5.4.4.3 Closure and Restoration of Unsanctioned Trails

Currently there are several unmanaged unsanctioned trails that connect with the official managed trail in the ESA. There may be opportunities to either manage or close and restore some or all these unsanctioned trails. As these trails were not assessed as part of the ecological inventory, a separate assessment of the trails may be warranted. However, since the preliminary mapping of management zones indicates the trails occur within the Nature Reserve Zone, if they were to remain open, they would be established as Level 1 trails.

Following assessment, if the trails are to be closed, the *Guidelines for Management Zones & Trails in Environmentally Significant Areas* present the following steps that should occur if feasible:

1. Construct new trail, reserving any plant material, topsoil, leaf litter, etc. that may be useful for restoration of closed trail.
2. Post "trail closed" sign at entrance to closed section of trail, in a location where it is easily seen by users.
3. Install temporary barrier fence, to protect work area on closed trail.
4. Break up or scarify soil on the closed section of trail to facilitate restoration planting, encourage natural regeneration, and make closed trail uninviting to users.
5. Restore closed trail with plant material, including plants moved from new trail as well as those from reliable native-plant nurseries. Choose plant species that are appropriate for the area in the ESA. In selecting plants, try to include some faster-growing species. Select tallest and fastest-growing shrubs for planting on the closed trail near the junction(s) with the new trail. This will help to hide the location of the former trail and discourage ongoing use. In addition to plants and/or cuttings, sow native seeds as appropriate.
6. Rake leaves onto former trail.
7. When new plants are well established, remove temporary barrier fence.
8. As required, construct a permanent barrier to reinforce the message that this trail is closed.

9. Install signage that redirects trail users.

6.0 Adaptive Management and Monitoring Framework

This CMP should be considered a living document that is periodically updated as required to address, through adaptive management, current or new threats or opportunities that may arise. This management approach allows for changes in the management strategy in response to the receipt and analysis of additional data from the implementation of the recommended management actions. Should an action be implemented, and the desired results are not achieved, management is adjusted, and monitoring of the adjusted strategy continues.

6.1 Approach to Adaptive Management

Adaptive management is typically applied once a baseline has been determined against which results of the implemented management strategy can be measured. Baseline data was collected as part of Phase I for this CMP, and additional data can be collected via monitoring conducted by the UTRCA or through public comment provided to the City. An effective monitoring program and the assessment of results is essential to the adaptive management approach so that the ecological integrity of the Kilally Meadows ESA can be maintained.

6.2 Invasive Species Management and Restoration Activities

The environmental significance of Kilally Meadows ESA has been recognized since the first lands were acquired by the City of London in 1970. Under the City's management, extensive restoration activities have been conducted in Kilally Meadows ESA and continue to be implemented.

6.2.1 City-funded Invasive Species Management and Restoration Activities

The ESA management team is funded and directed by the City and performs work in London's ESAs with the following general breakdown of activities:

- monitoring and enhancing natural resources (35% of the time)
- developing and maintaining trail network (35% of the time)
- enforcing provincial regulations and City by-laws, including encroachment (15% of the time)
- risk management, structure inspections, and tree hazard programs (10% of the time)
- coordinating educational programs, special events and community projects (5% of the time)

Over several decades, the ESA management team has completed an extensive amount of invasive species management and other restoration work in Kilally Meadows ESA including activities in most of the Restoration Overlays listed in **Table 12** (see **Section 5.3**). Specific invasive species management activities have included:

- **Dog-strangling Vine**: The ESA management team's licensed pesticide applicators have carefully applied herbicide to over 23 ha of Dog-strangling Vine in Kilally Meadows ESA since 2015 following OIPC BMPs. In 2018, the City and the ESA management team partnered with Silv-Econ Ltd. of Newmarket, Ontario, to release a moth, *Hypena opulenta,* in Kilally Meadows ESA as a management strategy for Dog-strangling Vine. Adults, larvae, and pupae were released in several locations in the ESA in 2018 and areas were monitored for *Hypena* establishment, spread, and effect on Dog-strangling Vine.
- **Buckthorn**: The ESA management team has removed over 13 ha of buckthorn, including Common Buckthorn and Glossy Buckthorn, from the ESA since 2013 following OIPC BMPs, specifically by very efficient basal bark application of Garlon™ herbicide (can carefully treat over 5,000 buckthorn trees in two days using this method).
- **Japanese Knotweed**: The ESA management team removed approximately 0.25 ha of Japanese Knotweed from Kilally Meadows ESA in 2017 following OIPC BMPs. As a result, this species has been nearly eliminated from the ESA.
- **Scots Pine**: The ESA management team has cut and pulled over 2.5 ha of Scots Pine since 2016 following OIPC BMPs. Individuals removed have ranged from seedlings to large, mature trees.
- **Giant Hogweed**: The ESA management team has removed scattered Giant Hogweed plants since 2010 following OIPC BMPs, primarily in the eastern end of the ESA to the south of the river.
- **Common Reed**: Common Reed is remarkably absent from Kilally Meadows ESA. The only known stand was sprayed by the ESA management team in 2018 following MNRF BMPs.
- **Other Invasives**: The ESA management team has removed other invasive species, such as Himalayan Balsam, on an incidental basis as localized patches are discovered and always following OIPC BMPs where available.

In addition to the invasive species management work completed up to 2018 (and included in the ERP) the ESA management team carried out additional work from 2019 and beyond. It is anticipated that this work will be consistent with the Restoration Overlays and priorities discussed in **Section 5.3**.

Other management activities undertaken by the ESA management team have included controlled burns and seeding of native species to restore prairie communities in the ESA. An area roughly coinciding with polygon 21 was burned in 2003. A four-year prairie restoration project was started in 2008 but did not continue beyond its first year.

6.3 Monitoring Framework

An overarching theme of the monitoring framework is to evaluate use of trails to manage changes within natural environments through the assessment of abiotic, biotic, and cultural components. The monitoring of the implemented strategies allows for the measurement of success and determine if adjustments are necessary. Monitoring results measure the effectiveness of management activities in maintaining alignment with the objectives. Should a management technique prove ineffective, a different method can be applied to achieve the desired results.

6.3.1 Abiotic

6.3.1.1 Trail Condition

Trails in Kilally Meadows ESA are well used by the public. The UTRCA monitors trails in the ESA and the City receives feedback and observations from the public. Indicators of trail conditions that may be monitored include:

- creation or use of unsanctioned side trails
- width of trail
- type and condition of trail substrate (e.g. bare dirt, woodchips, boardwalk, etc.)
- inundation of trail by water (e.g. ponding, flooding)

6.3.1.2 Erosion

Heavy trail use and natural conditions such as physiographic location of the trail (slope, valley bottom) and the presence of seeps and watercourses present challenges for the maintenance of trail conditions. Runoff and natural stream function remove exposed soils, depositing sediment, exposing the roots of vegetation and creating potentially unsafe conditions. Monitoring indicators can include:

- location and extent of erosion
- cause of erosion (if known)
- potential unsafe conditions resulting from erosion (steep slope, loose soil, slumping slopes, falling rocks or trees)

6.3.2 Biotic

Monitoring the biotic components of the ESA will consist of documenting the flora and fauna as well as wildlife habitat. The trends in populations of species are also to be documented (e.g., invasive species) to identify priority areas for control or restoration.

6.3.2.1 Sensitive Species

The unique setting of Kilally Meadows ESA provides for a diverse range of plant and wildlife species, some of which are sensitive or at risk. Both provincially listed SAR and provincially rare species are present as described in **Section 3.10**. Monitoring the health and abundance of sensitive species and any potential threats to them, such as invasive species, is recommended. The presence of previously undocumented sensitive species should also be recorded during monitoring.

6.3.2.2 Invasive Species

Several invasive plant species have been identified within the ESA, with some of them being particularly aggressive in their growth habits and establishment. Monitoring should occur in areas where management strategies are implemented to determine management effectiveness. The monitoring of known and new locations of invasive species where management is not implemented immediately should also be monitored to assess their extent, degree of spread, and potential impacts to nearby sensitive species.

6.3.3 Cultural

6.3.3.1 Encroachment

When determining if encroachment into the ESA has occurred, the ESA boundary (whether current or revised) should be utilized as the baseline. A review of aerial imagery with the boundary displayed will assist in the identification of encroachment areas. On-site assessment should also be undertaken to identify encroachment such as the dumping of yard waste, garden encroachments, vegetation removal, and clearing. City by-laws can aid in the enforcement of non-compliant persons.

6.3.3.2 Trails

The City *Guidelines for Management Zones and Trail in ESAs* (City of London, 2016) is the reference document for the management of trails and associated structures. Trails and structures are monitored by the UTRCA and are assessed for public safety and the need for replacement or renewal. Additionally, to assist with monitoring, public trail users can report issues with trails.

6.3.3.3 Non-permitted Uses

Non-permitted uses such as dumping of refuse, and construction of lean-to shelters using downed woody material from the forest floor should be documented. Incidental observations by monitoring staff or reports submitted by the public assist in identification and enforcement via the City's by-laws. Additional non-permitted uses that are subject to enforcement include off-leash dogs, bicycles, and campfires.

6.3.3.4 Restoration

The primary objectives of restoration are the control or removal of invasive species as well as the planting of native trees and shrubs. Monitoring would include the assessment of the health of restored areas and the abundance and spread of invasive species.

6.3.3.5 Naturalization

Naturalized areas can be monitored for a combination of items such as health and density of plantings, presence and abundance of invasive species, as well as non-permitted uses (garbage, unsanctioned trails, etc.).

6.3.4 Monitoring

Monitoring methods, frequency, and appropriate management responses are presented in **Table 15**.

Table 15. Monitoring Framework for Kilally Meadows ESA

Component	Monitoring Variable	Focus of Monitoring	Methods for Monitoring	Frequency	Requirements for Management Response	Management Response
Abiotic	Trail Condition	Unsanctioned trails, trail width, trail substrate, flooding	Document locations of trail saturation, widening, and unsanctioned trail connections	Annually	If annual review of data indicates continued trail issues, implement management response	Using the *Guidelines for Management Zones and Trails in Environmentally Significant Areas* (City of London, 2016), determine if the issue can be addressed through trail re-design or closure.
	Erosion	Areas of erosion and safety concerns	Record location, extent and cause of erosion (if known) and unsafe conditions resulting from erosion (steep slope, loose soil, slumping slopes, falling rocks or trees).	Annually	When erosion presents hazards to trails and trail users	Using the *Guidelines for Management Zones and Trails in Environmentally Significant Areas* (City of London, 2016), determine if additional measures, such as of trail structures (see **Section 7.2** of the Guidelines), can be implemented to address erosion concerns, or if trail should be realigned or closed.
Biotic	Sensitive Species	Presence and abundance of SAR and rare species within or in proximity to management activities	Follow methods in **Section 2** of this report to identify sensitive species; this may involve several methods (birds, vegetation).	One to three years following activity	Compare pre and post data to determine potential for impacts and implement management if impacts detected; if no impacts are detected, monitoring frequency may be reduced	Determine if species impacts resulting from activities/local conditions or possibly external factors such as decline of a species province-wide; next steps to be determined by management team
	Invasive Species	Non-native or invasive species in areas of management (restoration or naturalization)	Continued monitoring of management areas by professionals and public observations.	Annually in areas where SAR / rare species present; every two years where SAR / rare species not present	If recorded incidences of invasive species pose risk to the ESA, implement management response	Depending on target species, initiate best management and control practices if available; if not available, develop a management plan
Cultural	Encroachment	Yard waste, mowing/clearing, garden expansion	Continued monitoring by ESA management team and the encouragement of observation reporting from the public.	On going	When encroachment into the ESA boundaries has been identified	Initiate by-law enforcement for compliance, educate the public and surrounding community on encroachment impacts via mail outs, brochures, etc.

Component	Monitoring Variable	Focus of Monitoring	Methods for Monitoring	Frequency	Requirements for Management Response	Management Response
	Trails	Usage of existing trails and informal trails	Record the location and type of issue (structural wear/damage, informal trail use/creation).	Annually	Review every two years for indication of continued use of informal trails, structure damage; where usage continues or structure damage poses a safety risk, implement management response	Follow the trail closure process in **Section 7.2.6** of the *Guidelines for Management Zones and Trails in Environmentally Significant Areas* (City of London, 2016) and apply best management practices; for repair or replacement of damaged structures, apply safety measures as applicable (e.g., create barrier to hazard, temporarily close/reroute trail until repair or replacement has occurred)
	Non-permitted uses	By-law violations: littering, bicycles, off-leash dogs	Observations from management team, public observations and City by-law enforcement staff	Every two years	If review of data indicates continued or increasing violations, implement management response	Review of violation types; management team to determine corrective action approaches which could include additional enforcement, signs and education
	Restoration	Restoration overlay areas	Review of the restoration areas in **Table 12** to record the success and condition of plantings; where applicable, review the progress of succession; could be combined with other monitoring types (invasive species, etc.).	Every two years starting the year of restoration efforts	Review of data to determine if restoration efforts have been effective. If further effort is required, implement management response	Develop a restoration plan that is to be reviewed by the ESA management team prior to implementation.
	Naturalization	Naturalization areas	Review of the naturalization areas to record the success and condition of plantings; where applicable, review the progress of succession; could be combined with other monitoring types (invasive species, etc.).	Every two years starting the year of naturalization efforts	Review of data to determine if naturalization efforts have been effective. If further effort is required, implement management response.	Develop a naturalization plan that is to be reviewed by the ESA management team prior to implementation.

7.0 Community Engagement and Education

The purpose of community engagement pertaining to natural area protection is to promote education, awareness, and participation to develop interest in conservation. The resulting interest allows all to contribute and benefit from the natural area. Engagement can include stewardship initiatives that provide opportunities for public involvement, education, outreach and research.

7.1 Stewardship and Education

Stewardship refers to the care taken by one or more individuals of natural features and systems to protect or enhance their quality and functions, including the recognition that the outcomes of those actions are of benefit to all those who utilize natural areas

7.1.1 Existing Community Groups and Organizations

There are several different groups in the London area that engage in stewardship activities and promote and educate the community on local environmental issues. These groups aid in developing and maintaining an appreciation for the natural environment through various activities such as guided hikes, mood walks, newsletters, volunteer flora and fauna counts and monitoring, and educational events. Some of these organizations include:

- Friends of Kilally Meadows
- Nature London
- Thames Valley Trail Association

7.1.2 Citizen Science

The participation of community members in monitoring and education initiatives can benefit the protection and stewardship of the ESA while encouraging citizens to learn about the natural environment and the species that it supports. Potential efforts that could be implemented include:

- Christmas Bird Count
- butterfly / dragonfly counts
- Bumble Bee Watch
- recording and submitting flora and fauna observations via citizen science applications such as:
    - iNaturalist
    - eBird

7.1.3 Educational Initiatives

Local schools in the vicinity of Kilally Meadows ESA present opportunities for educational outreach and stewardship through engagement of staff and students. Potential initiatives should be devised to create interest and foster stewardship of the ESA among young people. Interactive presentations and activities allow students to develop an understanding for the need to manage and conserve the natural environment and spur involvement in community efforts. Such initiatives could include:

- in-class presentations
- guided hikes
- children's day camps
- citizen science
- restoration activities
- co-op placement with the UTRCA/City

7.1.4 Community Events

Community events can rally community members to a common cause and promote awareness of environmental stewardship. Initiatives including the City's Clean and Green Community Clean Up Day and similar events through Adopt-an-ESA encourage litter cleanup. Planting events or invasive plant species removal are also facilitated by Adopt-an-ESA groups and allow for public investment of effort, which can increase overall support of conservation and stewardship and increase compliance with ESA rules and by-laws. In coordination with the ESA management team, volunteers could be involved in community events to help restore tallgrass prairie habitat in Kilally Meadows ESA.

7.2 Engagement

7.2.1 Ecological Restoration Plan Engagement

As a part of the ERP process, a startup meeting was held at the City's Environmental and Parks Planning office on April 19, 2018. At this meeting, City staff presented the objectives of the ERP for Kilally Meadows ESA and summarized the ongoing restoration work. Members of the public and interested parties in attendance at the meeting had the opportunity to provide feedback on the ERP. Representatives from the City of London, Parsons, Upper Thames River Conservation Authority (UTRCA), Friends of Kilally Meadows, Thames Valley Trail Association, and members of the public were in attendance.

7.2.2 Public Information Centre

To expand on the consultation undertaken for the 2019 ERP work, a drop-in Public Information Center (PIC) was held on June 20, 2025, at City Hall. The focus of the PIC was to give interested parties an opportunity to review and provide feedback on the draft mapping for the Phase I CMP for Kilally Meadows ESA. Invitations were sent to various natural heritage associated community groups and organizations, including Nature London, Thames Talbot Land Trust, Friend of Kilally Meadows, North Ridge Community Association, Old Northeast Community Association, and Northeast London Community Engagement.

7.2.3 Get Involved Webpage

The draft Phase I CMP for Kilally Meadows ESA was posted on the Get Involved webpage on January 29, 2026; public comments submitted through this webpage were collected until March 23, 2026. Comments received are largely supportive of the proposed changes and have been reviewed and incorporated into the Phase I CMP for Kilally Meadows ESA, where appropriate.

7.2.4 Indigenous Engagement

City staff met with Chippewas of the Thames First Nation (COTTFN) and Oneida Nation of the Thames (Oneida Nation) to discuss the CMP and provide opportunities to include input into the process.

Phase I CMP documents for Kilally Meadows ESA were submitted through Nations Connect, as requested by COTTFN. The following materials were submitted on Nations Connect for review: the Get Involved webpage, a spatial file of the revised Kilally Meadows ESA boundary, the draft Phase I CMP for Kilally Meadows ESA, the Official Plan Amendment Notice of Application, and COTTFN meeting notes.

COTTFN expressed interest in having Indigenous art, design, and/or language incorporated in to trail signage; being involved in prescribed burns for tallgrass prairie restoration; and the development of additional mapping for First Nations community use. Oneida Nation was in agreement with the suggestions put forward by COTTFN, and also expressed interest in having Indigenous art, design, and/or language incorporated in to trail signage, with particular interest in having the Oneida language incorporated in to interactive trail signage; being involved in prescribed burns for tallgrass prairie restoration; and the development of additional mapping for First Nations community use.

Recommendations based on discussions with local First Nations Communities:

1. Biological inventories be established following any prescribed burns to determine if rare tallgrass prairie species persist in the seedbank of the area.
2. COTTFN and Oneida ecological monitors be present during any prescribed burns in Kilally Meadows ESA.
3. Indigenous art and design are recommended to be incorporated into trail signage at Kelly Stanton ESA. Wayfinding signs that include Ojibwe language (Deshkan Ziibii), and Quick Response (QR) signs that include information about native plants in Oneida language, are recommended to be developed.

7.3 Opportunities for Scientific Research

Scientific research conducted by professionals such as biologists, ecologists and other academics can expand knowledge of the cultural and natural environments of Kilally Meadows ESA. Proposed research is to be approved by the Managing Director of Parks and Recreation through the review of a submitted workplan that demonstrates no negative impact. The research must also adhere to all applicable provincial and federal legislation. Some suitable fields of study applicable to Kilally Meadows ESA include:

- vegetation, fish, wildlife, and landforms,
- SAR, rare species and communities,
- invasive species density and spread, and
- management and restoration.

8.0 Closure

We trust that this report meets the current requirements for the Phase I Conservation Master Plan for the Kilally Meadows ESA. Should there be any further questions or concerns, please do not hesitate to contact the undersigned.

Regards,

North-South Environmental Inc.

Pauline Catling, M.Sc.
Senior Ecologist
pcatling@nsenvironmental.com

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Appendix A: Maps

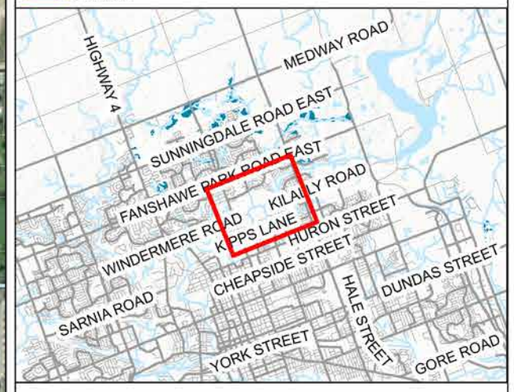
Map 1 | ESA Overview
Kilally South

Legend
- Study Area
- Roadway
- Watercourse
- Waterbody
- Access Point
- Park
- Municipal Drain
- SWM Facility

Ownership
- City Owned
- Private Parcels on ESA Perimeter
- UTRCA

Utilities
- Oil Pipeline Easement
- Sanitary Sewer
- Storm Pipe
- Transmission Line

Infrastructure
- Sanctioned Trail
- Bridge
- Staircase



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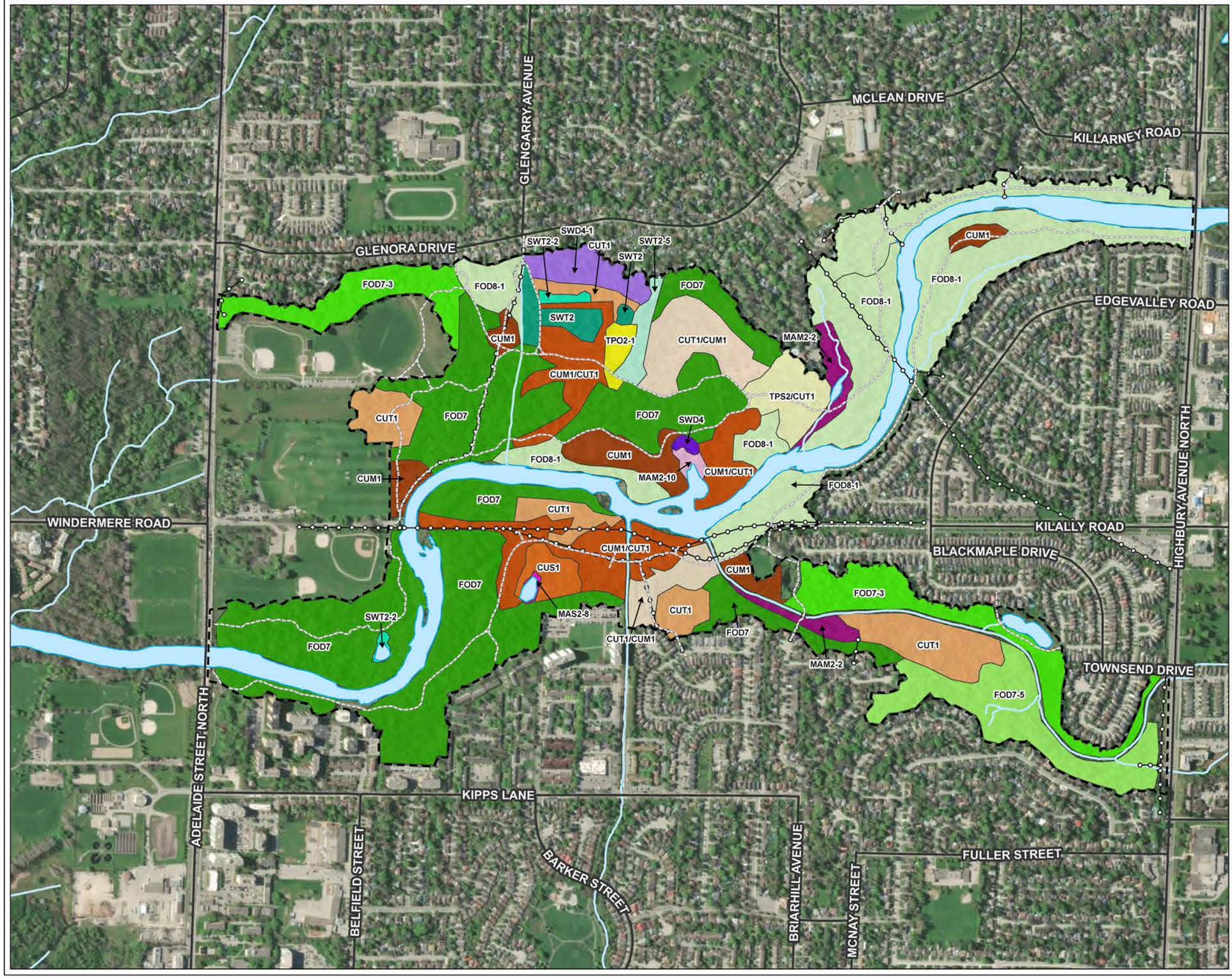
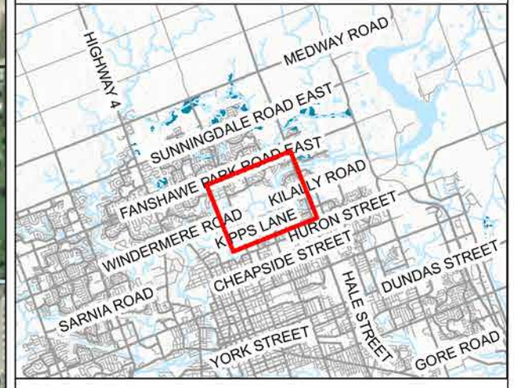
north-south ENVIRONMENTAL

Map 2 | Vegetation Communities
Kilally South





Legend

- Study Area
- Roadway
- Utilities
- Sanctioned Trail
- Watercourse
- Waterbody

Vegetation Communities

Forest
- FOD7 - Fresh Moist Lowland Deciduous Forest Ecosite
- FOD7-3 - Fresh Moist Willow Lowland Deciduous Forest Type
- FOD7-5 - Fresh Moist Black Maple Lowland Deciduous Forest Type
- FOD8-1 - Fresh Moist Poplar Deciduous Forest Type

Prairie and Savannah
- TPO2-1 - Fresh Moist Tallgrass Prairie Type
- TPS2/CUT1 - Moist Tallgrass Savanna Ecosite / Mineral Cultural Thicket Ecosite

Wetland
- MAM2-2 - Reed-canary Grass Mineral Meadow Marsh Type
- MAS2-8 -Prairie Slough Grass Mineral Meadow Marsh Type
- MAM2-10 - Forb Mineral Meadow Marsh Type
- SWD4 - Mineral Deciduous Swamp Ecosite
- SWD4-1 - Willow Mineral Deciduous Swamp Type
- SWT2 - Mineral Thicket Swamp Ecosite
- SWT2-2 - Willow Mineral Thicket Swamp Type
- SWT2-5 - Red-osier Mineral Thicket Swamp Type

Cultural
- CUM1 - Mineral Cultural Meadow Ecosite
- CUM1/CUT1 - Mineral Cultural Meadow Ecosite / Mineral Cultural Thicket Ecosite
- CUS1 - Mineral Cultural Savannah Ecosite
- CUT1 - Mineral Cultural Thicket Ecosite
- CUT1/CUM1 - Mineral Cultural Thicket Ecosite / Mineral Cultural Meadow Ecosite

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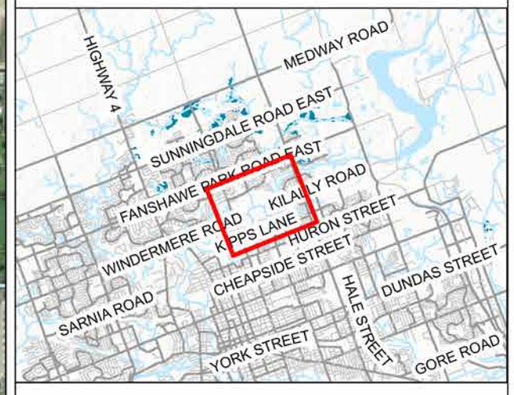
Map 3 | Significant Wildlife Habitat (SWH)
Kilally South

Legend

- Study Area
- Roadway
- Utilities
- Sanctioned Trail
- Watercourse
- Waterbody
- Parcels

Significant Wildlife Habitat

- Amphibian Breeding Habitat (Woodland)
- Fresh-Moist Tallgrass Prairie / Savannah
- Habitat for Great Plains Ladies'-tresses
- Habitat for Hackberry Emperor
- Habitat for Monarch
- Habitat for Soft Hairy False Gromwell
- Habitat for Striped Cream Violet
- Osprey Nesting, Foraging and Roosting Habitat



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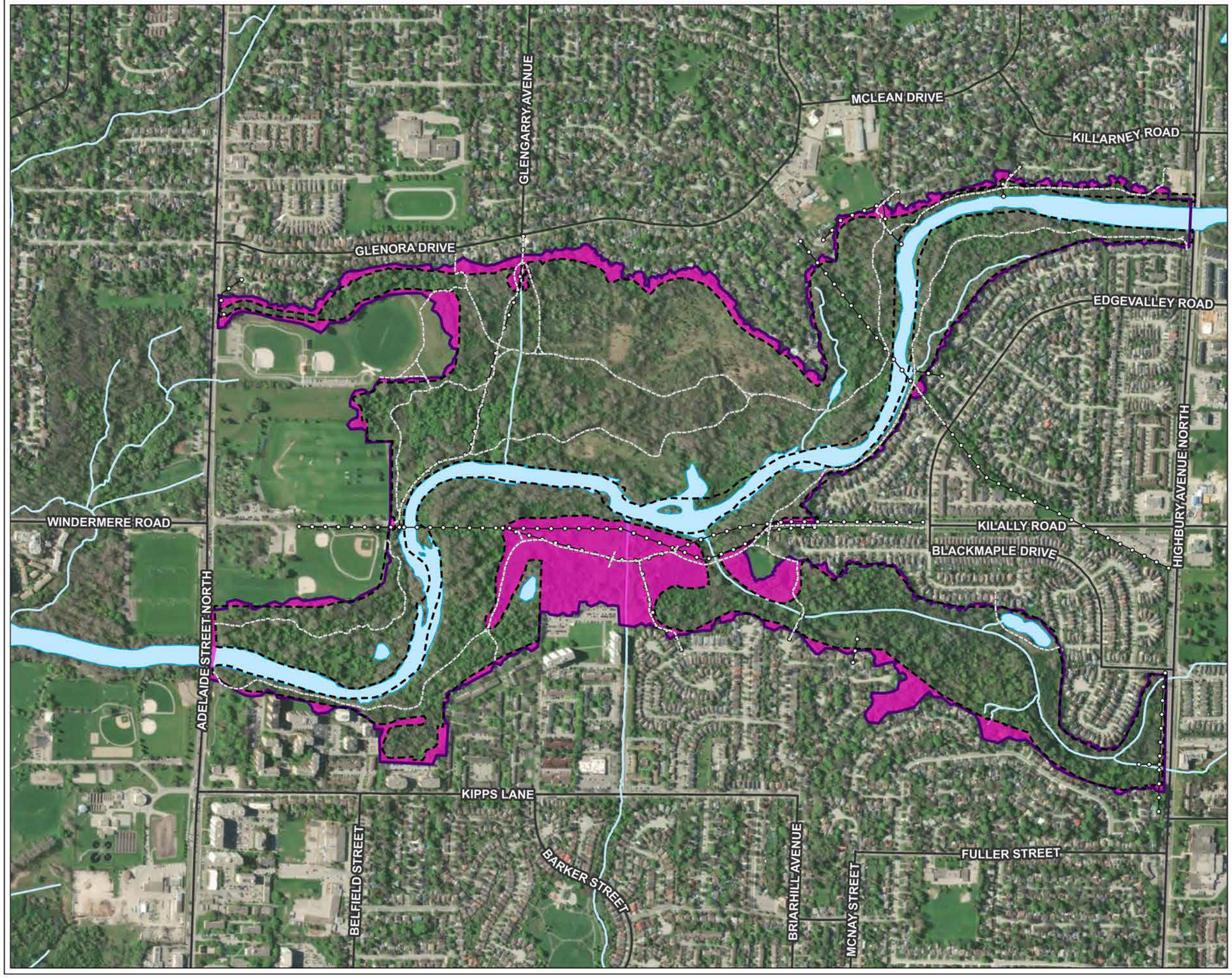
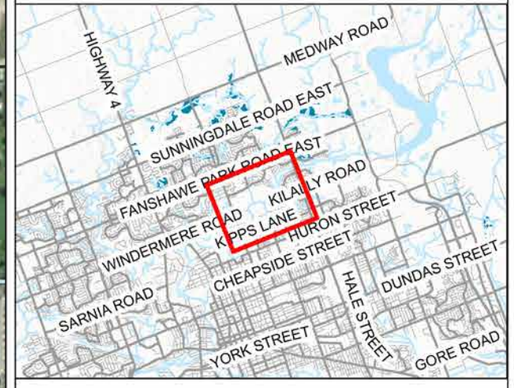
Map 4 | ESA Boundary Revisions

Kilally South



Legend

- Roadway
- Utilities
- Sanctioned Trail
- Watercourse
- Waterbody
- Existing ESA Boundary
- Proposed ESA Boundary
- Proposed ESA Area Added



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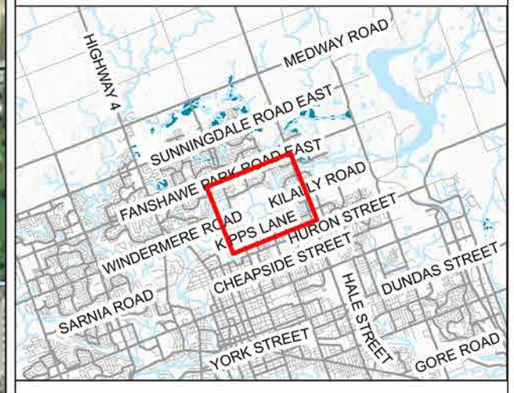
north-south ENVIRONMENTAL

Map 5 | Management Zones
Kilally South

Legend
- Study Area
- Roadway
- Utilities
- Sanctioned Trail
- Watercourse
- Waterbody
- Natural Environment
- Nature Reserve



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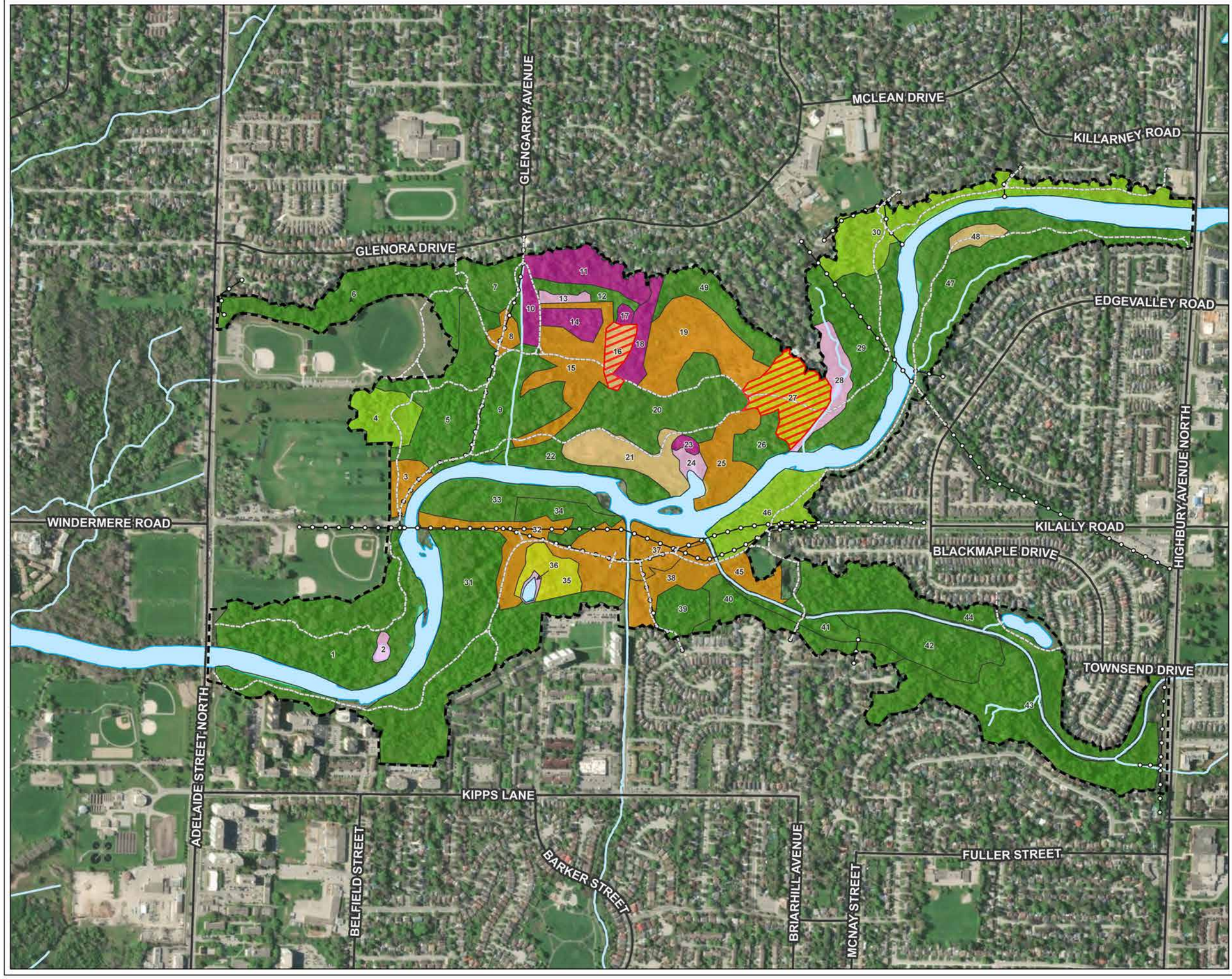
Map 6 | Restoration Overlays

Kilally South



Legend

- Study Area
- Roadway
- Utilities
- Sanctioned Trail
- Watercourse
- Waterbody
- Prescribed Burning

Invasive Species Management

Wetland Restoration

- High Density
- Low Density

Prairie Meadow Restoration

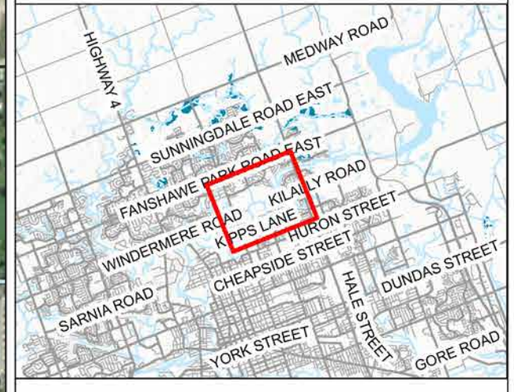
- High Density
- Low Density

Savannah Restoration

- High Density

Forest Restoration

- High Density
- Low Density



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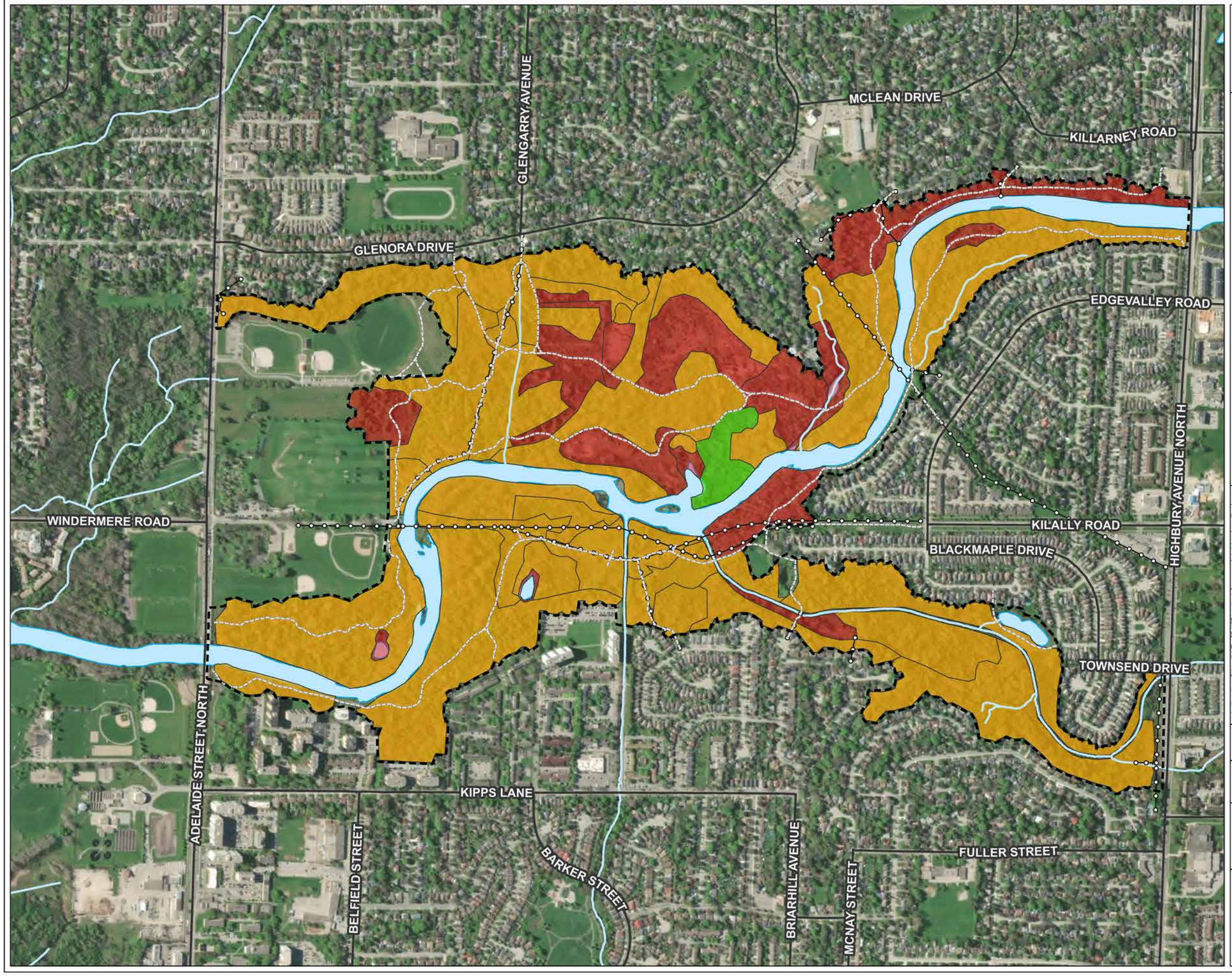
Map 7 | Restoration Priorities
Kilally South

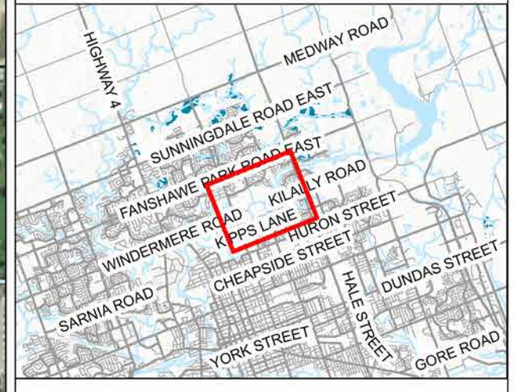


Legend

- Study Area
- Roadway
- Utilities
- Sanctioned Trail
- Watercourse
- Waterbody

Restoration Priority

- High
- Medium
- Low



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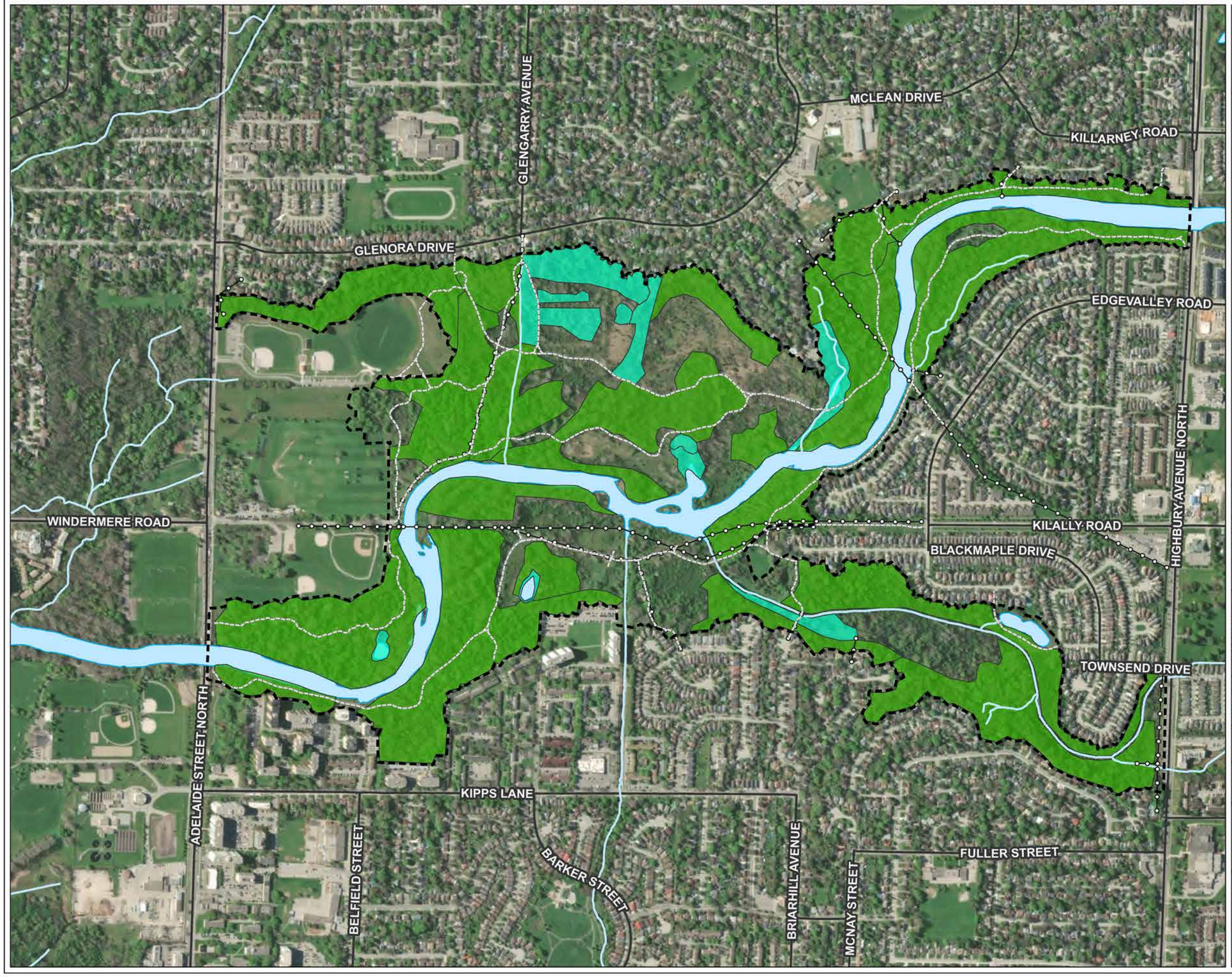
Map 8 | Natural Heritage Features Identified within ESA Boundary

Kilally South

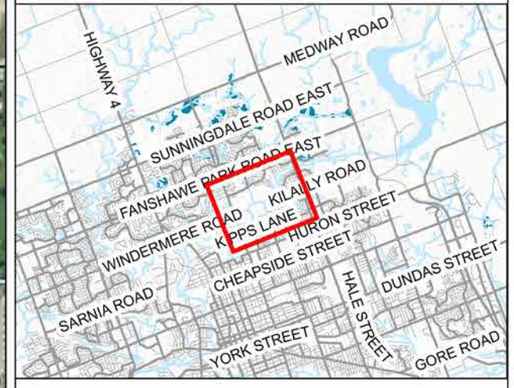


Legend

- Study Area
- Roadway
- Utilities
- Sanctioned Trail
- Watercourse
- Waterbody

Natural Heritage Features

- Significant Woodland
- Wetland



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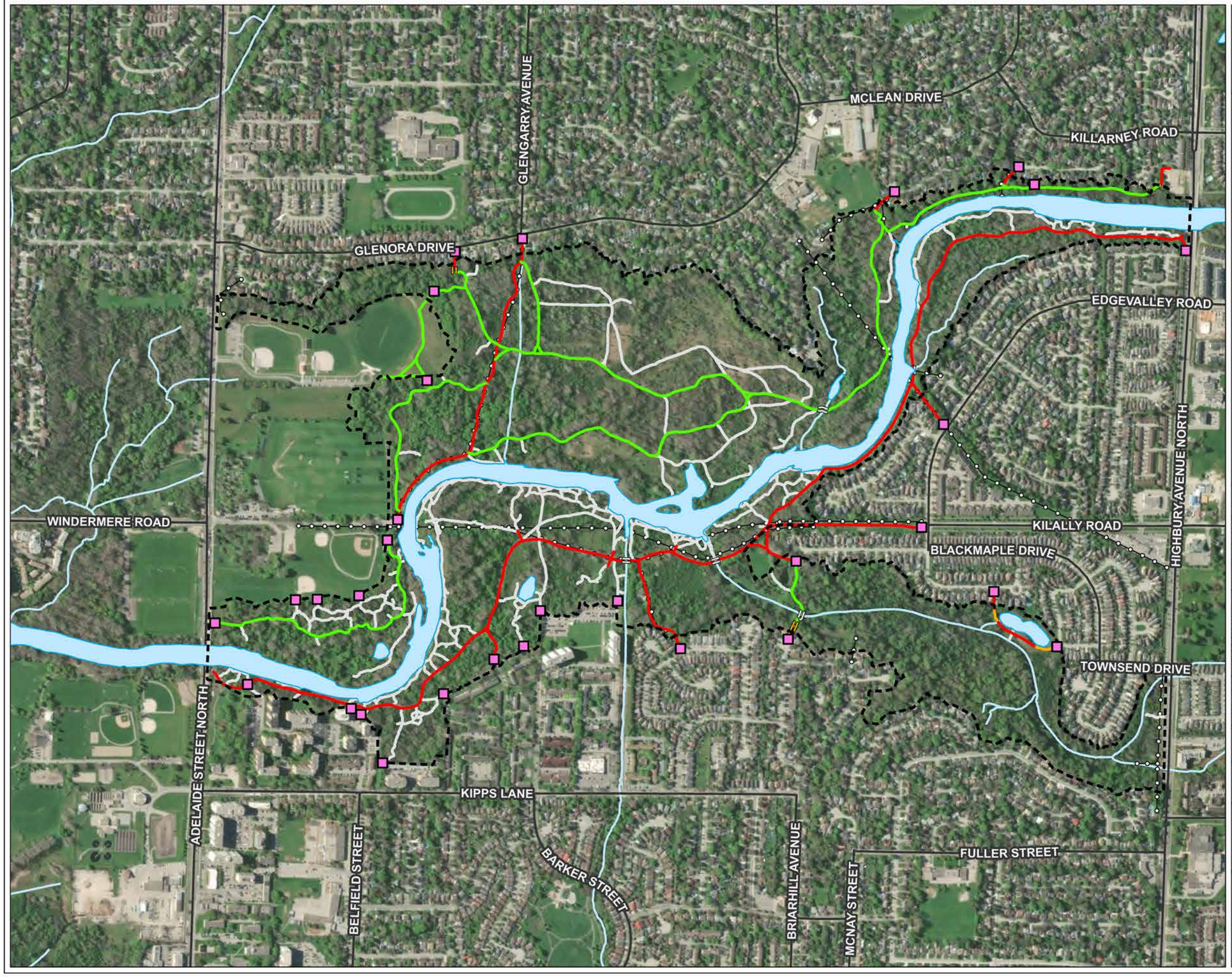


Map 9 | Trail Review Overlay

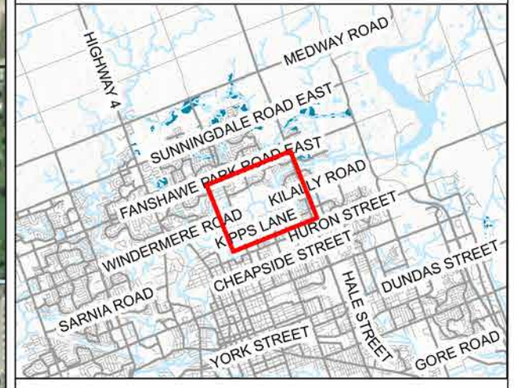
Kilally South

Legend

- Study Area
- Roadway
- Utilities
- Watercourse
- Waterbody
- Access Point

Trail Level

- Level 1
- Level 2
- Level 3 / Multiuse
- Unsanctioned Trail
- Bridge
- Staircase



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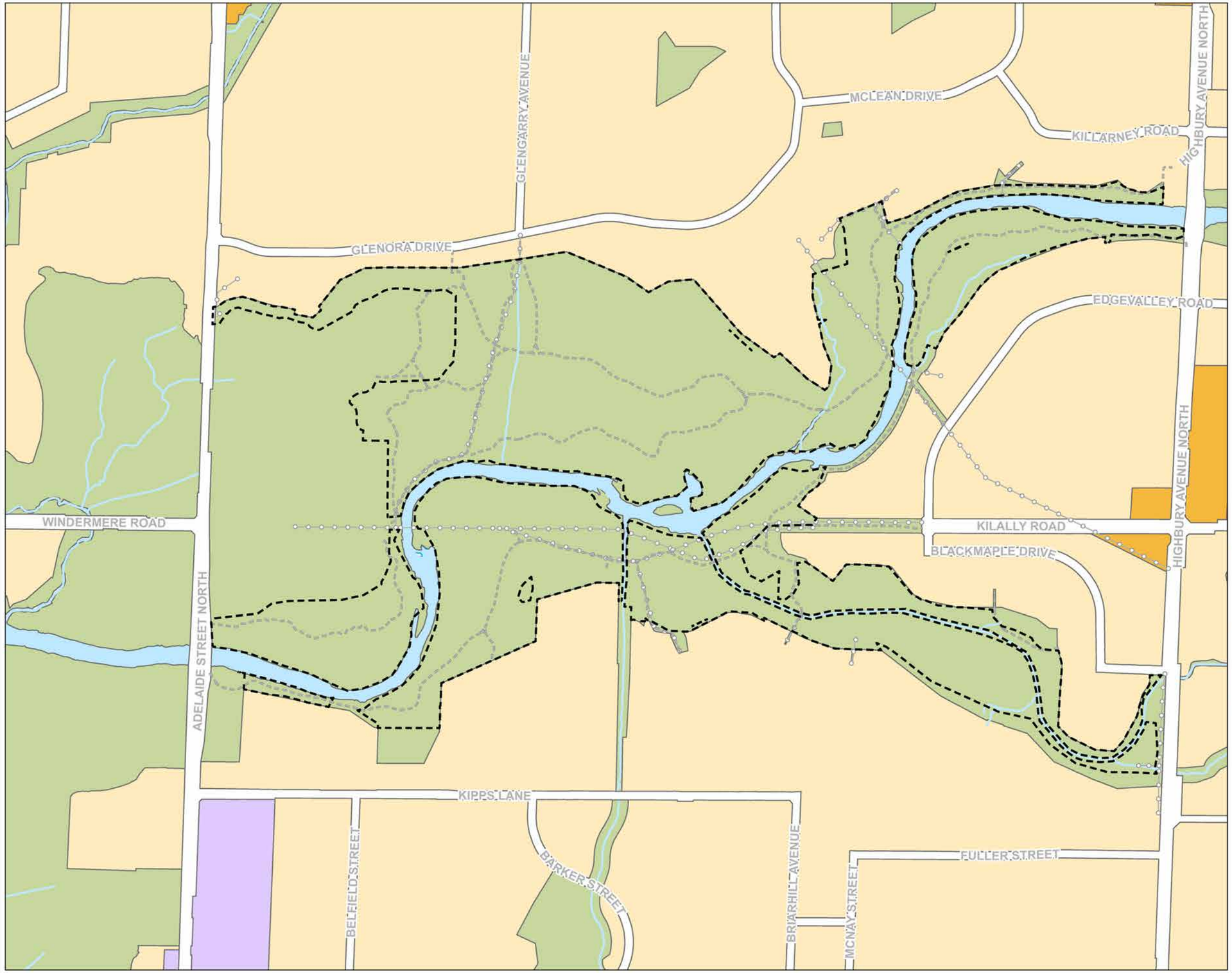


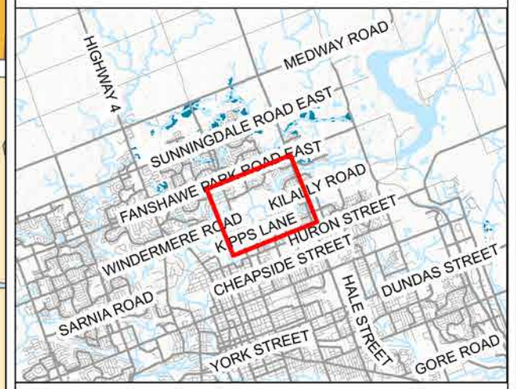
Map 10 | London Plan Map 1
Place Types
Kilally South

Legend

- Study Area
- Waterbody
- Watercourse
- Sanctioned Trail
- Utilities

Place Type

- Green Space
- Neighbourhoods
- Shopping Area
- Street Class Corridor
- Urban Corridor



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Project Number	Date:	N
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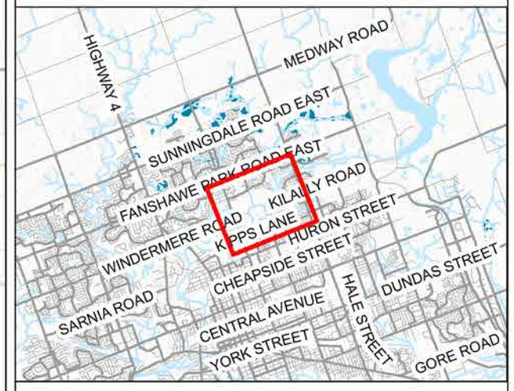
north-south ENVIRONMENTAL

Map 11 | Current London Plan
Map 5 Natural Heritage
Kilally South

Legend

- Environmentally Significant Areas
- Parcels
- Waterbody
- Watercourse
- Roadway
- Sanctioned Trail
- Utilities
- Potential Naturalization Area
- Unevaluated Vegetation Patch
- Unevaluated Wetland
- Significant Valleyland
- Subwatershed



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Project Number	Date:	
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north-south ENVIRONMENTAL

Appendix B: Plant and Wildlife Species Lists

Definitions:

ESA - Ontario Endangered Species Act. Species are listed as Endangered (END), Threatened (THR), and Special Concern (SC).

SARA - Canadian Species at Risk Act. END, THR, and SC categories as above.

COSEWIC - The Committee on the Status of Endangered Wildlife in Canada. END, THR, and SC categories as above.

SRANK - Subnational rankings for Ontario: S1 - extremely rare; S2 - very rare; S3 - rare to uncommon; S4 - common and apparently secure; S5 - very common and demonstrably secure; SNA - not ranked, usually refers to non-native species; SX – extirpated; SH – historic; SE – exotic; SNR/SU – unranked, usually due to lack of information. 'B' and 'N' are used as appropriate to indicate differences in breeding vs. non-breeding range status.

ERANK – Abundance rank for exotic species assigned by NHIC. E.g. SE1 – extremely rare exotic, SE5 – very common exotic

RRANK – Regional conservation ranking for Middlesex County (including London) from the List of the Vascular Plants of Ontario's Carolinian Zone (Oldham, 2017): H – historic; R – rare; U – uncommon; C – common; X – no status/data deficient; I – denotes exotic species; hyb – denotes a hybrid species

Table B1 – Vascular Plants

FAMILY	SCIENTIFIC NAME	COMMON NAME	STATUS			COMMUNITY SERIES WHERE FOUND									
			SRANK	RRANK	ERANK	CUM	CUS	CUT	FOD	MAM	MAS	SWD	SWT	TPO	TPS
Moschatel Family Adoxaceae	*Viburnum lentago*	Nannyberry	S5	C		X		X	X						
	Viburnum opulus var. opulus	European Cranberry Viburnum	SNA	IR	SE5	X		X	X						
Water-plantain Family Alismataceae	*Sagittaria latifolia*	Broad-leaved Arrowhead	S5	C					X	X	X				
Amaranth Family Amaranthaceae	*Chenopodium album*	Lamb's-quarters	SNA	IX	SE5	X		X	X						
Amaryllis Family Amaryllidaceae	*Allium canadense*	Canada Garlic	S5	U					X						
	Allium tricoccum	Wild Leek	S5	C					X						
	Allium vineale	Wild Garlic	SNA	IR	SE2				X						
Cashew Family Anacardiaceae	*Rhus aromatica*	Fragrant Sumac	S4	R		X		X							
	Rhus typhina	Staghorn Sumac	S5	C		X	X	X							X
	Toxicodendron radicans	Poison Ivy	S5	C		X	X	X	X					X	X
Parsley Family Apiaceae	*Aegopodium podagraria*	Goutweed	SNA	IU	SE5				X						
	Angelica atropurpurea	Great Angelica	S5	C					X						
	Anthriscus sylvestris	Wild Chervil	SNA	IR	SE4?	X			X						
	Cicuta maculata	Water Hemlock	S5	IX						X	X	X			
	Cryptotaenia canadensis	Canada Honewort	S5	X					X						
	Daucus carota	Wild Carrot	SNA	IC	SE5	X	X	X						X	X
	Heracleum maximum	Cow-parsnip	S5	X					X						
	Heracleum sphondylium	Common Hogweed	SNA		SE1				X						
	Osmorhiza claytoniana	Sweet Cicely	S5	X					X						
	Osmorhiza longistylis	Aniseroot	S5	X					X						
	Sanicula odorata	Clustered Snakeroot	S5	X					X						
	Sanicula trifoliata	Three-leaved Snakeroot	S4	X					X						
	Zizia aurea	Golden Alexanders	S5	X					X						
Dogbane Family Apocynaceae	*Apocynum androsaemifolium*	Spreading Dogbane	S5	C		X	X	X	X					X	X
	Apocynum cannabinum	Hemp Dogbane	S5	C		X									
	Asclepias incarnata	Swamp Milkweed	S5	C					X	X	X	X			
	Asclepias syriaca	Common Milkweed	S5	C		X	X	X	X					X	X
	Asclepias tuberosa	Butterfly Milkweed	S4	U		X									
	Asclepias verticillata	Whorled Milkweed	S4	(R)		X		X							
	Vinca minor	Dwarf Periwinkle	SNA	IR	SE5				X						

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			SRANK	RRANK	ERANK	CUM	CUS	CUT	FOD	MAM	MAS	SWD	SWT	TPO	TPS
	Vincetoxicum rossicum	Dog-strangling Vine	SNA	IR	SE5	X	X	X	X	X				X	X
Arum Family Araceae	*Arisaema triphyllum*	Jack-in-the-pulpit	S5	C					X						
	Lemna minor	Small Duckweed	S5	X						X	X	X	X		
	Symplocarpus foetidus	Skunk Cabbage	S5	C					X			X			
Asparagus Family Asparagaceae	*Convallaria majalis*	European Lily-of-the-valley	SNA	IR	SE5				X						
	Maianthemum racemosum	False Solomon's-seal	S5	X					X						
	Maianthemum stellatum	Starry False Solomon's-seal	S5	X		X		X	X						
	Ornithogalum umbellatum	Star-of-Bethlehem	SNA	IR	SE3	X									
	Polygonatum pubescens	Hairy Solomon's-seal	S5	X					X						
Asphodel Family Asphodelaceae	*Hemerocallis fulva*	Orange Daylily	SNA	IX	SE5				X						
Aster Family Asteraceae	*Achillea borealis*	Common Yarrow	S5	C		X	X	X	X					X	X
	Ageratina altissima	White Snake Root	S5	C					X						
	Ambrosia artemisiifolia	Eastern Ragweed	S5	C		X	X	X	X					X	X
	Ambrosia trifida	Tall Ragweed	S5	C					X						
	Arctium lappa	Greater Burdock	SNA	IR	SE5				X						
	Arctium minus	Lesser Burdock	SNA	IC	SE5	X		X	X						
	Bidens cernua	Nodding Beggarticks	S5	X					X	X	X	X			
	Bidens frondosa	Devil's Beggarticks	S5	X					X						
	Centaurea stoebe	Spotted Knapweed	SNA	IX	SE5	X	X	X						X	X
	Centaurea x moncktonii	Monckton's Knapweed	SNA	hyb	SE	X									
	Cichorium intybus	Chicory	SNA	IC	SE5	X	X	X	X					X	X
	Cirsium arvense	Canada Thistle	SNA	IC	SE5	X									X
	Cirsium vulgare	Bull Thistle	SNA	IX	SE5	X									
	Coreopsis grandiflora	Large-flowered Tickseed	SNA	IR	SE3?				X						
	Erigeron annuus	Annual Fleabane	S5	C		X	X	X	X						
	Erigeron canadensis	Horseweed	S5	C		X	X	X	X					X	X
	Erigeron philadelphicus	Philadelphia Fleabane	S5	C		X									
	Erigeron pulchellus	Robin's-plantain	S5	X		X		X							
	Erigeron strigosus	Daisy Fleabane	S5	C		X	X	X	X					X	X
	Eupatorium perfoliatum	Common Boneset	S5	C					X	X					
	Euthamia graminifolia	Grass-leaved Goldentop	S5	C		X	X	X		X				X	X
	Eutrochium maculatum	Spotted Joe-Pye-weed	S5	C					X	X	X				

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			SRANK	RRANK	ERANK	CUM	CUS	CUT	FOD	MAM	MAS	SWD	SWT	TPO	TPS
	Helianthus decapetalus	Thin-leaved Sunflower	S4	X					X						
	Helianthus giganteus	Tall Sunflower	S5	X		X		X	X						
	Helianthus tuberosus	Jerusalem Artichoke	SU	X					X						
	Helianthus x laetiflorus	Perennial Sunflower	SNA	hyb					X						
	Lapsana communis	Nipplewort	SNA	IR	SE5				X						
	Leucanthemum vulgare	Oxeye Daisy	SNA	IC	SE5	X	X	X	X						
	Onopordum acanthium	Cotton Thistle	SNA	IX	SE4	X									
	Pilosella caespitosa	Meadow Hawkweed	SNA	IX	SE5	X									
	Rudbeckia hirta	Black-eyed-Susan	S5	C		X	X	X	X					X	X
	Rudbeckia laciniata	Cut-leaved Coneflower	S5	X		X			X						
	Rudbeckia subtomentosa	Sweet Black-eyed-Susan	SNA		SE			X							
	Rudbeckia triloba	Brown-eyed-Susan	SNA	IR	SE4				X						
	Solidago altissima	Late Goldenrod	S5	U		X	X	X	X					X	X
	Solidago caesia	Blue-stemmed Goldenrod	S5	X					X						
	Solidago flexicaulis	Zigzag Goldenrod	S5	X					X						
	Solidago gigantea	Tall Goldenrod	S5	X					X	X					
	Solidago juncea	Early Goldenrod	S5	X		X		X							
	Solidago nemoralis	Field Goldenrod	S5	X		X	X	X						X	X
	Solidago rugosa	Rough Goldenrod	S5	X					X						
	Sonchus arvensis ssp. arvensis	Common Sow-thistle	SNA	IX	SE5	X		X							
	Sonchus arvensis ssp. uliginosus	Field Sow-thistle	SNA	IX	SE5	X		X							
	Symphyotrichum ericoides	Heath Aster	S5	C		X	X	X						X	X
	Symphyotrichum novae-angliae	New England Aster	S5	C		X	X	X	X					X	X
	Symphyotrichum laeve	Smooth Aster	S5	C		X	X	X						X	X
	Symphyotrichum lanceolatum	Panicled Aster	S5	C		X		X	X	X	X				
	Symphyotrichum lateriflorum	Calico Aster	S5	C					X						
	Symphyotrichum ontarionis var. glabratum	Smooth Ontario Aster	S5						X	X		X			
	Symphyotrichum ontarionis var. ontarionis	Ontario Aster	S4									X			
	Symphyotrichum pilosum var. pilosum	Frost Aster	S5	X		X		X							

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			SRANK	RRANK	ERANK	CUM	CUS	CUT	FOD	MAM	MAS	SWD	SWT	TPO	TPS
	Symphyotrichum puniceum	Swamp Aster	S5	X						X	X	X			
	Symphyotrichum urophyllum	Arrow-leaved Aster	S4	X		X	X	X	X					X	X
	Tanacetum vulgare	Common Tansy	SNA	IC	SE5	X		X							
	Taraxacum officinale	Common Dandelion	SNA	IC	SE5	X		X							
	Tragopogon dubius	Yellow Salsify	SNA	IX	SE5	X		X							
	Tussilago farfara	Coltsfoot	SNA	IC	SE5	X		X							
	Xanthium strumarium	Rough Cocklebur	S5	C		X			X						
Balsam Family Balsaminaceae	*Impatiens capensis*	Spotted Jewelweed	S5	C					X	X	X				
	Impatiens glandulifera	Himalayan Balsam	SNA	IR	SE4	X			X						
	Impatiens pallida	Pale Jewelweed	S4	X					X						
Barberry Family Berberidaceae	*Berberis vulgaris*	European Barberry	SNA	IX	SE5	X	X	X	X					X	X
	Podophyllum peltatum	Mayapple	S5	X					X						
Birch Family Betulaceae	*Alnus glutinosa*	European Black Alder	SNA	IU	SE4				X						
	Betula alleghaniensis	Yellow Birch	S5	X					X						
	Betula pendula	Silver Birch	SNA	IR	SE4				X						
	Ostrya virginiana	Hop-hornbeam	S5	C					X						
Borage Family Boraginaceae	*Echium vulgare*	Viper's-bugloss	SNA	IC	SE5	X	X	X						X	X
	Hackelia virginiana	Virginia Stickseed	S5	U					X						
	Hydrophyllum virginianum	Virginia Waterleaf	S5	C					X						
	Lithospermum officinale	Common Gromwell	SNA	IX	SE5	X		X	X						
	Lithospermum parviflorum	Soft Hairy False Gromwell	S2	R		X		X	X						
	Myosotis scorpioides	Water Forget-me-not	SNA	IX	SE5					X	X	X			
Mustard Family Brassicaceae	*Alliaria petiolata*	Garlic Mustard	SNA	IC	SE5				X						
	Barbarea vulgaris	Yellow-rocket	SNA	IC	SE5				X						
	Brassica rapa	Field Mustard	SNA	IX	SE5	X									
	Cardamine concatenata	Cut-leaved Toothwort	S5	X					X						
	Cardamine hirsuta	Hairy Bittercress	SNA	IR	SE4				X						
	Diplotaxis muralis	Annual Wall-rocket	SNA	IR	SE3				X						
	Draba verna	Spring Draba	SNA	IX	SE5	X									
	Hesperis matronalis	Dame's-rocket	SNA	IX	SE5				X						
	Nasturtium officinale	Common Watercress	SNA	IX	SE						X				
	Lobelia inflata	Indian-tobacco	S5	X					X						

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			SRANK	RRANK	ERANK	CUM	CUS	CUT	FOD	MAM	MAS	SWD	SWT	TPO	TPS
Bellflower Family Campanulaceae	*Lobelia siphilitica*	Blue Lobelia	S5	X					X						
Honeysuckle Family Caprifoliaceae	*Lonicera maackii*	Amur Honeysuckle	SNA	IR	SE2	X		X							
	Lonicera morrowii	Morrow's Honeysuckle	SNA	IR	SE3	X		X							
	Lonicera tatarica	Tartarian Honeysuckle	SNA	IX	SE5	X		X							
	Lonicera x bella	Bell's Honeysuckle	SNA		SE4	X		X	X						
Pink Family Caryophyllaceae	*Dianthus armeria*	Deptford Pink	SNA	IX	SE5	X		X							
	Saponaria officinalis	Common Soapwort	SNA	IX	SE5	X		X	X						
	Silene latifolia	White Campion	SNA	IX	SE5	X		X	X						
	Silene vulgaris	Bladder Campion	SNA	IX	SE5	X	X	X	X					X	X
Stafftree Family Celastraceae	*Celastrus scandens*	American Bittersweet	S5	X				X	X						
	Euonymus alatus	Winged Euonymus	SNA		SE2				X						
	Euonymus europaeus	European Spindle	SNA	IR	SE2				X						
	Euonymus fortunei	Fortune's Spindle	SNA	IR	SE2				X						
	Euonymus obovatus	Running Strawberry-bush	S4	C					X						
Bindweed Family Convolvulaceae	*Calystegia sepium*	Hedge Bindweed	S5	X		X		X	X	X					
	Convolvulus arvensis	Field Bindweed	SNA	IX	SE5	X		X							
	Cuscuta gronovii	Field Dodder	S5?	C					X	X					
Dogwood Family Cornaceae	*Cornus alternifolia*	Pagoda Dogwood	S5	X					X						
	Cornus racemosa	Grey Dogwood	S5	X				X	X			X	X		
	Cornus sericea	Red-osier Dogwood	S5	C						X			X		
Gourd Family Cucurbitaceae	*Echinocystis lobata*	Wild Cucumber	S5	X		X		X	X	X					
Cypress Family Cupressaceae	*Juniperus virginiana*	Eastern Juniper	S5	X		X	X	X						X	X
	Thuja occidentalis	Northern White Cedar	S5	X					X						
Sedge Family Cyperaceae	*Carex blanda*	Eastern Woodland Sedge	S5	C				X	X						
	Carex cephaloidea	Thin-leaved Sedge	S4	U					X						
	Carex deweyana	Dewey's Sedge	S5	C					X						
	Carex hirta	Hairy Sedge	SNA	IU	SE2	X			X						
	Carex laxiflora	Loose-flowered Sedge	S5	C					X						
	Carex pedunculata	Long-stalked Sedge	S5	C					X						
	Carex pellita	Woolly Sedge	S5	C		X									
	Carex pensylvanica	Oak Sedge	S5	C					X						

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			SRANK	RRANK	ERANK	CUM	CUS	CUT	FOD	MAM	MAS	SWD	SWT	TPO	TPS
	Carex retrorsa	Retrorse Sedge	S5	C								X	X		
	Carex stipata	Awl-fruited Sedge	S5	C					X		X	X			
	Carex tribuloides	Blunt Broom Sedge	S4	U					X						
	Cyperus erythrorhizos	Red-rooted Flatsedge	S4	R					X						
	Schoenoplectus tabernaemontani	Soft-stemmed Bulrush	S5	C					X		X				
	Scirpus atrovirens	Dark Green Bulrush	S5	C					X						
	Scirpus pendulus	Nodding Bulrush	S5	C		X									
Teasel Family Dipsacaceae	*Dipsacus fullonum*	Fuller's Teasel	SNA	IC	SE5	X		X							
Oleaster Family Elaeagnaceae	*Elaeagnus umbellata*	Autumn Olive	SNA	IR	SE5	X		X						X	X
Horsetail Family Equisetaceae	*Equisetum arvense*	Field Horsetail	S5	C		X		X	X						
	Equisetum hyemale	Rough Horsetail	S5	C		X		X							
	Equisetum laevigatum	Smooth Horsetail	S4	R		X		X							
	Equisetum palustre	Marsh Horsetail	S5	R									X		
	Equisetum variegatum	Variegated Horsetail	S5	U									X		
Spurge Family Euphorbiaceae	*Acalypha rhomboidea*	Three-seeded Mercury	S5	C		X		X	X						
	Euphorbia cyparissis	Cypress Spurge	SNA	IX	SE5	X		X							
Bean Family Fabaceae	*Amphicarpaea bracteata*	American Hog-peanut	S5	C					X						
	Apios americana	American Groundnut	S5	C					X						
	Desmodium canadense	Showy Tick-trefoil	S5	X		X		X							
	Lathyrus latifolius	Everlasting Pea	SNA	IX	SE5	X		X							
	Lotus corniculatus	Bird's-foot Trefoil	SNA	IX	SE5	X	X	X							
	Medicago lupulina	Black Medick	SNA	IC	SE5	X	X	X							
	Medicago sativa	Alfalfa	SNA	IC	SE5	X		X							
	Melilotus albus	White Sweet-clover	SNA	IC	SE5	X	X	X						X	X
	Melilotus officinalis	Yellow Sweet-clover	SNA	IC	SE5	X		X							
	Robinia pseudoacacia	Black Locust	SNA	IC	SE5				X						
	Securigera varia	Crown Vetch	SNA	IX	SE5	X									
	Trifolium hybridum	Hybrid Clover	SNA	IX	SE5	X									
	Trifolium pratense	Red Clover	SNA	IX	SE5	X									
	Trifolium repens	White Clover	SNA	IX	SE5	X		X	X						
	Vicia cracca	Cow Vetch	SNA	IX	SE5	X		X							
Beech Family Fagaceae	*Fagus grandifolia*	American Beech	S5	C					X						

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			SRANK	RRANK	ERANK	CUM	CUS	CUT	FOD	MAM	MAS	SWD	SWT	TPO	TPS
	Quercus alba	White Oak	S5	C					X						
	Quercus macrocarpa	Bur Oak	S5	C			X	X	X						X
	Quercus rubra	Northern Red Oak	S5	C					X						
Geranium Family Geraniaceae	*Geranium maculatum*	Spotted Geranium	S5	X					X						
Currant Family Grossulariaceae	*Ribes americanum*	American Black Currant	S5	C					X						
	Ribes cynosbati	Prickly Gooseberry	S5	C					X						
	Ribes rubrum	Red Currant	SNA	IR	SE5				X						
Seaberry Family Haloragaceae	*Myriophyllum spicatum*	Eurasian Watermilfoil	SNA		SE5					X	X				
St. John's-wort Family Hypericaceae	*Hypericum perforatum*	Common St. John's-wort	SNA	IC	SE5	X	X	X	X	X					X
Iris Family Iridaceae	*Iris versicolor*	Northern Blueflag Iris	S5	X					X	X					
	Sisyrinchium montanum	Strict Blue-eyed-grass	S5	X		X		X	X					X	X
Walnut Family Juglandaceae	*Carya cordiformis*	Bitternut Hickory	S5	X					X						
	Carya ovata	Shagbark Hickory	S5	X					X						
	Junglans cinerea	Butternut	S2?	X		X									
	Juglans nigra	Black Walnut	S4?	X		X		X	X						
Rush Family Juncaceae	*Juncus dudleyi*	Dudley's Rush	S5	C		X									
	Juncus pylaei	Pyle's Rush	S5	X							X	X	X		
	Juncus tenuis	Slender Rush	S5	X		X		X	X						
Mint Family Lamiaceae	*Clinopodium vulgare*	Wild Basil	S5	X		X	X	X	X					X	X
	Glechoma hederacea	Creeping Charlie	SNA	IX	SE5				X						
	Lamium maculatum	Spotted Deadnettle	SNA		SE2				X						
	Lamium purpureum	Purple Deadnettle	SNA	IR	SE3				X						
	Leonurus cardiaca	Motherwort	SNA	IC	SE5	X		X	X						
	Mentha aquatica	Water Mint	SNA		SE1						X				
	Mentha canadensis	American Cornmint	S5	X					X	X	X				
	Monarda fistulosa	Wild Bergamot	S5	C		X									
	Origanum vulgare	Oregano	SNA	IU	SE5				X						
	Prunella vulgaris	Self-heal	S5	C				X	X						
	Scutellaria lateriflora	Side-flowering Skullcap	S5	X					X	X					
	Stachys palustris	Marsh Woundwort	SNA	IX	SE5				X						
Lily Family Liliaceae	*Erythronium albidum*	White Trout-lily	S4	X					X						

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			SRANK	RRANK	ERANK	CUM	CUS	CUT	FOD	MAM	MAS	SWD	SWT	TPO	TPS
	Erythronium americanum	Yellow Trout-lily	S5	X					X						
Loosestrife Family Lythraceae	*Lythrum salicaria*	Purple Loosestrife	SNA	IC	SE5	X		X	X	X	X	X	X		
Mallow Family Malvaceae	*Malva alcea*	Greater Musk Mallow	SNA		SE1	X									
	Tilia americana	Basswood	S5	C				X	X						
	Tilia cordata	Little-leaf Linden	SNA		SE1				X						
Bunchflower Family Melanthiaceae	*Trillium grandiflorum*	White Trillium	S5	X					X						
Moonseed Family Menispermaceae	*Menispermum canadense*	Canadian Moonseed	S4	X					X						
Miner's Lettuce Family Montiaceae	*Claytonia virginica*	Virginia Spring-beauty	S5	C					X						
Mulberry Family Moraceae	*Morus alba*	White Mulberry	SNA	IX	SE5				X						
Waterlily Family Nymphaeaceae	*Nuphar variegata*	Variegated Pond-lily	S5	X						X	X				
Olive Family Oleaceae	*Fraxinus americana*	White Ash	S4	C				X	X						
	Fraxinus pennsylvanica	Green Ash	S4	C				X	X						
	Ligustrum vulgare	Common Privet	SNA	IX	SE5	X	X	X	X						X
	Syringa vulgaris	Common Lilac	SNA	IX	SE5	X		X							
Evening-primrose Family	*Circaea canadensis*	Broad-leaved Enchanter's-nightshade	S5	X					X						
Onagraceae	*Ludwigia palustris*	Water Purslane	S5	X						X	X				
	Oenothera parviflora	Northern Evening-primrose	S5	X		X	X	X	X					X	X
Sensitive Fern Family	*Matteuccia struthiopteris*	Ostrich Fern	S5	X					X						
Onocleaceae	*Onoclea sensibilis*	Sensitive Fern	S5	X					X	X					
Orchid Family Orchidaceae	*Epipactis helleborine*	Helleborine Orchid	SNA	IX	SE5				X						
	Spiranthes magnicamporum	Great Plains Ladies'-tresses	S3	R		X		X							
Cancer-root Family	*Odontites vernus*	Red Bartsia				X		X							
Orobanchaceae	*Orobanche uniflora*	One-flowered Cancer-root	S4	R					X						
Wood Sorrel Family Oxalidaceae	*Oxalis stricta*	Common Wood Sorrel	S5	X					X						
Poppy Family Papveraceae	*Dicentra cucullaria*	Dutchman's-breeches	S5	X					X						
	Sanguinaria canadensis	Bloodroot	S5	X					X						
Lopseed Family Phrymaceae	*Phryma leptostachya*	American Lopseed	S5	X					X						

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			SRANK	RRANK	ERANK	CUM	CUS	CUT	FOD	MAM	MAS	SWD	SWT	TPO	TPS
Pine Family Pinaceae	*Picea abies*	Norway Spruce	SNA	IX	SE3								X		
	Pinus strobus	Eastern White Pine	S5	X			X	X	X						
	Pinus sylvestris	Scots Pine	SNA	IR	SE5	X		X							X
Plantain Family Plantaginaceae	*Linaria vulgaris*	Butter-and-eggs	SNA	IC	SE5	X	X	X	X					X	X
	Penstemon digitalis	Foxglove Beardtongue		X		X		X							
	Plantago lanceolata	English Plantain	SNA	IC	SE5	X	X	X	X					X	X
	Plantago major	Common Plantain	SNA	IC	SE5	X									
	Plantago rugelii	Rugel's Plantain	S5	C		X			X						
	Veronica polita	Wayside Speedwell	SNA	IX	SE4	X									
Plane Tree Family Platanaceae	*Platanus occidentalis*	American Sycamore	S4	X				X	X						
Grass Family Poaceae	*Agrostis stolonifera*	Creeping Bentgrass	SNA	IC	SE5	X	X	X						X	X
	Andropogon gerardii	Big Bluestem	S4	C		X		X						X	X
	Bromus inermis	Smooth Brome	SNA	IC	SE5	X	X	X						X	X
	Dactylis glomerata	Orchard Grass	SNA	IC	SE5	X	X	X						X	X
	Dichanthelium acuminatum ssp. implicatum	Hairy Rosette Panicgrass	S5	X		X		X						X	X
	Digitaria ischaemum	Smooth Crabgras	SNA	IX	SE5	X									
	Echinochloa muricata	Rough Barnyard Grass	S5	X					X	X					
	Elymus villosus	Silky Wild Rye	S4	X					X						
	Elymus virginicus	Virginia Wild Rye	S5	X					X						
	Eragrostis pectinacea	Tufted Lovegrass	S5	X		X								X	
	Festuca rubra	Red Fescue	SNA	IX	SE5	X		X							
	Glyceria striata	Fowl Mannagrass	S5	X					X						
	Leersia oryzoides	Rice Cutgrass	S5	X					X	X	X	X			
	Leersia virginica	White-grained Cutgrass	S4	X					X						
	Muhlenbergia frondosa	Wire-stemmed Muhly	S4	X		X			X						
	Muhlenbergia mexicana	Mexican Muhly	S5	C					X						
	Muhlenbergia schreberi	Nimblewill	S4	X		X		X	X						
	Phalaris arundinacea	Reed Canary Grass	S5	X						X					
	Phragmites australis ssp. australis	European Common Reed	SNA	X	SE5				X		X				
	Panicum capillare	Witch Grass	S5	X		X									

FAMILY	SCIENTIFIC NAME	COMMON NAME	STATUS			COMMUNITY SERIES WHERE FOUND									
			SRANK	RRANK	ERANK	CUM	CUS	CUT	FOD	MAM	MAS	SWD	SWT	TPO	TPS
	Panicum philadelphicum ssp. philadelphicum	Philadelphia Panicgrass	S4	R					X						
	Panicum virgatum	Switchgrass	S4	X		X		X						X	X
	Poa compressa	Canadian Bluegrass	SNA	IX	SE5	X	X	X	X					X	X
	Poa pratensis	Kentucky Bluegrass	SNA	IC	SE5	X	X	X							
	Schizachyrium scoparium	Little Bluestem	S4	X		X		X						X	X
	Setaria pumila	Yellow Foxtail	SNA	IX	SE5	X									
	Sorghastrum nutans	Indian Grass	S4	X		X		X						X	X
	Spartina pectinata	Prairie Cordgrass	S4	X		X									
	Sporobolus vaginiflorus	Sheathed Dropseed	S5	X		X									X
Knotweed Family Polygonaceae	*Fallopia scandens*	Climbing False Buckwheat	S4S5	X					X						
	Persicaria maculosa	Lady's-thumb	SNA	IX	SE5	X		X	X						
	Persicaria pensylvanica	Pinkweed	S5	X					X						
	Persicaria punctata	Dotted Smartweed	S5	X					X						
	Persicaria virginiana	Jumpseed	S4	X					X						
	Polygonum aviculare	Prostrate Knotweed	SNA	IC	SE5	X									
	Polygonum ramosissimum	Bushy Knotweed	S4			X		X							
	Reynoutria japonica	Japanese Knotweed	SNA	IU	SE5				X						
	Rumex crispus	Curled Dock	SNA	IC	SE5	X			X	X					
	Rumex obtusifolius	Bitter Dock	SNA	IX	SE5				X						
Pondweed Family Potamogetonaceae	*Potamogeton natans*	Floating-leaved Pondweed	S5	R						X					
	Stuckenia pectinata	Sago Pondweed	S5	X					X						
Primrose Family Primulaceae	*Lysimachia ciliata*	Fringed Loosestrife	S5	X					X						
	Lysimachia nummularia	Creeping Jenny	SNA	IX	SE5				X						
Buttercup Family Ranunculaceae	*Actaea pachypoda*	White Baneberry	S5	C					X						
	Anemone canadensis	Meadow Anemone	S5	C					X						
	Anemone quinquefolia	Wood Anemone	S5	C					X						
	Anemone virginiana	Tall Thimbleweed	S5	C		X		X	X						
	Caltha palustris	Marsh Marigold	S5	C						X					
	Clematis virginiana	Virgin's-bower	S5	C					X						
	Ficaria verna	Lesser Celandine	SNA	IR	SE1					X					
	Ranunculus abortivus	Kidney-leaved Buttercup	S5	C					X						

FAMILY	SCIENTIFIC NAME	COMMON NAME	STATUS			COMMUNITY SERIES WHERE FOUND									
			SRANK	RRANK	ERANK	CUM	CUS	CUT	FOD	MAM	MAS	SWD	SWT	TPO	TPS
	Ranunculus hispidus var. caricetorum	Hispid Buttercup	S5	C					X	X	X		X		
	Ranunculus recurvatus	Hooked Buttercup	S5	X					X						
	Ranunculus repens	Creeping Buttercup	SNA	IO	SE5				X						
	Ranunculus sceleratus	Cursed Buttercup	S5	X						X					
	Thalictrum dioicum	Early Meadow-rue	S5	X					X						
	Thalictrum pubescens	Tall Meadow-rue	S5	X		X		X	X						
Buckthorn Family Rhamnaceae	*Frangula alnus*	Glossy Buckthorn	SNA	IU	SE5				X			X	X		
	Rhamnus cathartica	Common Buckthorn	SNA	IC	SE5	X	X	X	X				X	X	X
Rose Family Rosaceae	*Agrimonia gryposepala*	Common Agrimony	S5	C					X						
	Crataegus punctata	Dotted Hawthorn	S5	C				X							
	Fragaria virginiana	Field Strawberry	S5	C		X	X	X	X					X	X
	Geum canadense	White Avens	S5	X					X						
	Geum laciniatum	Slashed Avens	S4	X					X						
	Geum urbanum	Wood Avens	SNA	IR	SE3				X						
	Geum x catlingii	Catling's Avens	SNA	hyb	SE1				X						
	Malus pumila	Wild Apple	SNA	IX	SE4	X		X	X						
	Physocarpus opulifolius	Common Ninebark	S5	X		X		X	X						X
	Potentilla recta	Sulphur Cinquefoil	SNA	IX	SE5	X									
	Potentilla simplex	Common Cinquefoil	S5	X		X									
	Prunus americana	American Plum	S4	X				X							
	Prunus serotina	Black Cherry	S5	C					X						
	Prunus virginiana	Choke Cherry	S5	C		X		X	X						
	Rosa multiflora	Multiflora Rose	SNA	IX	SE5	X		X	X						
	Rubus allegheniensis	Allegheny Blackberry	S5	C					X						
	Rubus idaeus ssp. strigosus	American Red Raspberry	S5	X		X		X	X						
	Rubus occidentalis	Western Black Raspberry	S5	X					X						
	Sanguisorba minor	Salad Burnet	SNA	IX	SE4	X		X							X
Madder Family Rubiaceae	*Galium mollugo*	Hedge Bedstraw	SNA	IX	SE5	X	X	X	X					X	X
	Galium odoratum	Sweet Woodruffe	SNA		SE1				X						
	Galium palustre	Marsh Bedstraw	S5	X								X			
	Triosteum aurantiacum	Orange-fruited Horse-gentian	S4S5	X					X						

FAMILY	SCIENTIFIC NAME	COMMON NAME	STATUS			COMMUNITY SERIES WHERE FOUND									
			SRANK	RRANK	ERANK	CUM	CUS	CUT	FOD	MAM	MAS	SWD	SWT	TPO	TPS
Citrus Family Rutaceae	*Zanthoxylum americanum*	Northern Prickly-ash	S5	C		X		X	X						
Willow Family Salicaceae	*Populus deltoides*	Eastern Cottonwood	S5	X		X	X	X	X					X	X
	Populus tremuloides	Trembling Aspen	S5	X					X						
	Salix alba	White Willow	SNA	IX	SE5				X	X	X	X	X		
	Salix amygdaloides	Peach-leaved Willow	S5	X								X	X		
	Salix discolor	American Pussy Willow	S5	X							X		X		
	Salix eriocephala	Woolly-headed Willow	S5	X							X		X		
	Salix euxina	Crack Willow	SNA	IX	SE							X	X		
	Salix interior	Sandbar Willow	S5	C					X				X		
	Salix lucida	Shining Willow	S5	X									X		
	Salix matsudana	Corkscrew Willow	SNA		SE1							X			
	Salix nigra	Black Willow	S4	X					X	X			X		
	Salix petiolaris	Meadow Willow	S5	X									X		
Soapberry Family Sapindaceae	*Acer negundo*	Manitoba Maple	S5	C		X	X	X	X	X					
	Acer nigrum	Black Maple	S5	C					X						
	Acer saccharinum	Silver Maple	S5	C					X						
	Acer saccharum	Sugar Maple	S5	C					X						
Saxifrage Family Saxifragaceae	*Tiarella cordifolia*	Heart-leaved Foamflower	S5	X					X						
Figwort Family Scrophulariaceae	*Scrophularia marilandica*	Carpenter's-square	S4	X					X						
	Verbascum blattaria	Moth Mullein	SNA	IC	SE5	X									
	Verbascum thapsus	Common Mullein	SNA	IC	SE5	X	X	X	X					X	X
Spikemoss Family Selaginellaceae	*Selaginella eclipes*	Hidden Spikemoss	S4	X				X							
Nightshade Family Solanaceae	*Physalis heterophylla*	Clammy Groundcherry	S5	X		X		X						X	X
	Solanum dulcamara	Bittersweet Nightshade	SNA	IC	SE5			X	X	X	X				
	Solanum ptychanthum	Eastern Black Nightshade	S5	X		X									
Bladdernut Family Staphyleaceae	*Staphylea trifolia*	American Bladdernut	S4	X					X						
Cattail Family Typhaceae	*Typha latifolia*	Broad-leaved Cattail	S5	X						X	X				
Elm Family Ulmaceae	*Celtis occidentalis*	Northern Hackberry	S5	X		X		X	X						
	Ulmus americana	White Elm	S5	X				X	X						
	Ulmus pumila	Siberian Elm	SNA	IR	SE3			X							

FAMILY	SCIENTIFIC NAME	COMMON NAME	STATUS			COMMUNITY SERIES WHERE FOUND									
			SRANK	RRANK	ERANK	CUM	CUS	CUT	FOD	MAM	MAS	SWD	SWT	TPO	TPS
	Ulmus rubra	Slippery Elm	S5	X				X							
Nettle Family Urticaceae	*Boehmeria cylindrica*	Cylindrical False Nettle	S5	X					X	X	X	X			
	Laportea canadensis	Canada Wood Nettle	S5	X				X							
	Pilea fontana	Spring Clearweed	S4	R				X							
	Pilea pumila	Common Clearweed	S5	X				X							
	Urtica dioica ssp. gracilis	American Stinging Nettle	S5	C					X	X	X				
Vervain Family Verbenaceae	*Verbena hastata*	Blue Vervain	S5	C		X				X	X				
	Verbena stricta	Hoary Vervain	S4	R		X		X						X	X
	Verbena urticifolia	White Vervain	S5	X					X						
Violet Family Violaceae	*Viola cucullata*	Swamp Violet	S5	X					X						
	Viola labradorica	American Dog Violet	S5	X					X						
	Viola odorata	Sweet Violet	SNA	IR	SE2				X						
	Viola pubescens	Downy Yellow Violet	S5	C					X						
	Viola rostrata	Long-spurred Violet	S5	X					X						
	Viola sororia	Common Blue Violet	S5	X				X	X						
	Viola striata	Striped Cream Violet	S3	U					X						
Grape Family Vitaceae	*Parthenocissus quinquefolia*	Virginia Creeper	S4?	X					X						
	Parthenocissus vitacea	Thicket Creeper	S5	X					X						
	Vitis riparia	Riverbank Grape	S5	C		X	X	X	X						

Table B2 – Birds

SCIENTIFIC NAME	COMMON NAME	STATUS				HIGHEST BREEDING EVIDENCE	COMMUNITY SERIES WHERE FOUND									
		SARA	ESA	SRANK	CONS. PRIORITY		CUM	CUS	CUT	FOD	MAM	MAS	SWD	SWT	TPO	TPS	River
Actitis macularius	Spotted Sandpiper			S5	L3	Possible – in appropriate habitat											X
Agelaius phoeniceus	Red-winged Blackbird			S4		Confirmed – fledged young	X	X	X	X							X
Anas platyrhynchos	Mallard			S5		Confirmed – fledged young											X
Ardea herodias	Great Blue Heron			S4		Possible – in appropriate habitat											X

SCIENTIFIC NAME	COMMON NAME	STATUS				HIGHEST BREEDING EVIDENCE	COMMUNITY SERIES WHERE FOUND										
		SARA	ESA	SRANK	CONS. PRIORITY		CUM	CUS	CUT	FOD	MAM	MAS	SWD	SWT	TPO	TPS	River
Bombycilla cedrorum	Cedar Waxwing			S5B		Possible – in appropriate habitat			X	X							
Branta canadensis	Canada Goose			S5		Confirmed – occupied nest	X										X
Buteo jamaicensis	Red-tailed Hawk			S5		Observed											
Butorides virescens	Green Heron			S4B	L3	Observed											
Cardinalis cardinalis	Northern Cardinal			S5		Probable – pairs observed in suitable habitat	X	X	X	X			X				
Cathartes aura	Turkey Vulture			S5B	L3	Observed											
Catharus guttatus	Hermit Thrush			S5B		Migrant				X							
Charadrius vociferus	Killdeer			S5B, S5N		Possible – in appropriate habitat	X										X
Colaptes auratus	Northern Flicker			S4B		Probable – nest building	X		X	X							
Columba livia	Rock Pigeon			SNA		Observed											
Contopus virens	Eastern Wood-pewee	SC	SC	S4B		Probable - male singing on territory 7+ days				X							
Corvus brachyrhynchos	American Crow			S5B		Possible – in appropriate habitat				X							
Cyanocitta cristata	Blue Jay			S5		Possible – in appropriate habitat			X	X							
Dumetella carolinensis	Grey Catbird			S4B	L4	Probable – agitated behavior	X	X	X	X					X	X	
Empidonax minimus	Least Flycatcher			S4B	L3	Possible – in appropriate habitat			X								
Empidonax traillii	Willow Flycatcher			S5B		Probable - male singing on territory 7+ days	X		X						X	X	
Geothlypis philadelphia	Mourning Warbler			S4B	L2	Migrant		X									
Geothlypis trichas	Common Yellowthroat			S5B	L3	Possible – in appropriate habitat								X			
Haemorhous mexicanus	House Finch			SNA		Possible – in appropriate habitat		X	X	X							

SCIENTIFIC NAME	COMMON NAME	STATUS				HIGHEST BREEDING EVIDENCE	COMMUNITY SERIES WHERE FOUND										
		SARA	ESA	SRANK	CONS. PRIORITY		CUM	CUS	CUT	FOD	MAM	MAS	SWD	SWT	TPO	TPS	River
Hirundo rustica	Barn Swallow	THR	THR	S4B	L3	Confirmed – carrying nest material (collecting mud for nest – actual nest may be off site)											
Hylocichla mustelina	Wood Thrush	THR	SC	S4B	L4	Probable – Male singing on territory 7+ days				X							
Icterus galbula	Baltimore Oriole			S4B		Probable – courtship display (males in pursuit of female)			X	X						X	
Larus delawarensis	Ring-billed Gull			S5B, S4N		Observed											
Leiothlypis ruficapilla	Nashville Warbler			S5B	L2	Migrant			X								
Leuconotopicus villosus	Hairy Woodpecker			S5		Probable – pairs observed in suitable habitat				X							
Megaceryle alcyon	Belted Kingfisher			S4B		Possible – in appropriate habitat											X
Melanerpes carolinus	Red-bellied Woodpecker			S4	L1	Possible – in appropriate habitat				X							
Meleagris gallopavo	Wild Turkey			S5		Confirmed – fledged young	X		X	X							
Melospiza melodia	Song Sparrow			S5B		Confirmed – nest with eggs					X	X	X	X			X
Mergus merganser	Common Merganser			S5B, S5N		Migrant											X
Mniotilta varia	Black-and-white Warbler			S5	L3	Migrant				X							
Molothrus ater	Brown-headed Cowbird			S4B		Probable – pairs observed in suitable habitat	X		X								
Myiarchus crinitus	Great Crested Flycatcher			S4B		Probable - male singing on territory 7+ days				X							
Pandion haliaetus	Osprey			S5B		Confirmed – nesting on platform at edge of sports field											
Passer domesticus	House Sparrow			SNA		Probable – pairs observed in suitable habitat	X		X								

SCIENTIFIC NAME	COMMON NAME	STATUS				HIGHEST BREEDING EVIDENCE	COMMUNITY SERIES WHERE FOUND										
		SARA	ESA	SRANK	CONS. PRIORITY		CUM	CUS	CUT	FOD	MAM	MAS	SWD	SWT	TPO	TPS	River
Passerina cyanea	Indigo Bunting			S4B		Probable – pair in suitable habitat			X	X							
Pheucticus ludovicianus	Rose-breasted Grosbeak			S4B		Probable – agitated behavior				X							
Picoides pubescens	Downy Woodpecker			S5		Confirmed – fledged young				X							
Poecile atricapillus	Black-capped Chickadee			S5	L4	Probable - male singing on territory 7+ days				X							
Polioptila caerulea	Blue-gray Gnatcatcher			S4B	L4	Confirmed – fledged young		X	X	X							
Regulus calendula	Ruby-crowned Kinglet			S4B	L4	Migrant			X								
Quiscalus quiscula	Common Grackle			S5B		Possible – in appropriate habitat	X	X	X	X			X			X	
Scolopax minor	American Woodcock			S4B	L4	Probable – mating display	X	X	X						X	X	
Setophaga americana	Northern Parula			S4B		Migrant				X							
Setophaga coronata	Yellow-rumped Warbler			S5B	L3	Migrant			X	X	X	X					
Setophaga fusca	Blackburnian Warbler			S5B	L2	Migrant				X							
Setophaga magnolia	Magnolia Warbler			S5B	L1	Migrant				X							
Setophaga petechia	Yellow Warbler			S5B		Probable - male singing on territory 7+ days				X	X	X	X				
Setophaga ruticilla	American Redstart			S5B	L2	Probable - male singing on territory 7+ days	X	X	X	X							
Setophaga tigrina	Cape May Warbler			S5B		Migrant				X							
Sitta carolinensis	White-breasted Nuthatch			S5		Possible – in appropriate habitat				X							
Spinus tristis	American Goldfinch			S5B	L3	Probable – pair in suitable habitat	X	X	X	X					X	X	
Spizella passerina	Chipping Sparrow			S5B		Possible – in appropriate habitat	X	X	X	X							

SCIENTIFIC NAME	COMMON NAME	STATUS				HIGHEST BREEDING EVIDENCE	COMMUNITY SERIES WHERE FOUND										
		SARA	ESA	SRANK	CONS. PRIORITY		CUM	CUS	CUT	FOD	MAM	MAS	SWD	SWT	TPO	TPS	River
Spizella pusilla	Field Sparrow			S4B	L3	Probable - male singing on territory 7+ days	X	X	X						X	X	
Stelgidopteryx serripennis	Northern Rough-winged Swallow			S4B	L2	Possible – in appropriate habitat											X
Sturnus vulgaris	European Starling			SNA		Possible – in appropriate habitat	X		X								
Tachycineta bicolor	Tree Swallow			S4B		Possible – in appropriate habitat	X										X
Troglodytes aedon	House Wren			S5B		Probable - male singing on territory 7+ days	X	X	X						X	X	
Turdus migratorius	American Robin			S5B		Confirmed – fledged young	X	X	X	X					X	X	
Tyrannus tyrannus	Eastern Kingbird			S4B	L3	Probable – visiting probable nest site			X	X							
Vireo gilvus	Warbling Vireo			S5B		Probable – male singing on territory 7+ days	X	X	X	X							
Vireo olivaceus	Red-eyed Vireo			S5B		Possible – singing male				X							
Vireo solitarius	Blue-headed Vireo			S5B		Migrant				X							
Zenaida macroura	Mourning Dove			S5		Possible – in appropriate habitat	X	X	X								
Zonotrichia albicollis	White-throated Sparrow			S5B	L2	Migrant	X		X								

Table B3 – Reptiles and Amphibians

SCIENTIFIC NAME	COMMON NAME	STATUS			COMMENTS	VEGETATION COMMUNITY WHERE FOUND									
		SARA	ESA	SRANK		CUM	CUS	CUT	FOD	MAM	MAS	SWD	SWT	TPO	TPS
Anaxyrus americanus	American Toad			S5	Call Code 2-3				X				X		
Apalone spinifera	Spiny Softshell	END	END	S2	Seen in river. Not observed in ELC community within Kilally Meadows ESA but expected to use site to nest.										
Graptemys geographica	Northern Map Turtle	SC	SC	S3	Seen in river. Not observed in ELC community within Kilally Meadows ESA but expected to use site to nest.										
Lithobates pipiens	Northern Leopard Frog			S5					X						
Pseudacris crucifer	Spring Peeper			S5	Call Code 3								X		
Pseudacris triseriata	Western Chorus Frog			S4	Call Code 3								X		
Thamnophis sirtalis sirtalis	Common Eastern Garter Snake			S5	Multiple individuals observed in grassy areas and at thicket edges	X	X	X	X					X	

Table B4 – Mammals

SCIENTIFIC NAME	COMMON NAME	STATUS			COMMENTS	VEGETATION COMMUNITY WHERE FOUND									
		SARA	ESA	SRANK		CUM	CUS	CUT	FOD	MAM	MAS	SWD	SWT	TPO	TPS
Marmota monax	Woodchuck			S5	Burrow observed	X									
Odocoileus virginianus	White-tailed Deer			S5	Tracks observed				X			X	X		
Procyon lotor	Raccoon			S5	Tracks observed			X	X						
Sciurus carolinensis	Eastern Gray Squirrel			S5					X						
Sylvilagus floridanus	Eastern Cottontail			S5		X		X							

Table B5 – Arthropods

SCIENTIFIC NAME	COMMON NAME	STATUS			COMMENTS	VEGETATION COMMUNITY WHERE FOUND									
		SARA	ESA	SRANK		CUM	CUS	CUT	FOD	MAM	MAS	SWD	SWT	TPO	TPS
Agapostemon sp.	Striped Sweat Bee species					X									
Anax junius	Common Green Darner			S5					X						
Apis mellifera	Honey Bee			SNA		X		X							
Asterocampa celtis	Hackberry Emperor			S3	Hackberry trees abundant in area	X		X	X						
Bombus impatiens	Common Eastern Bumble Bee			S4S5		X									
Celastrina sp.	Holarctic Azure species					X									
Choristoneura rosaceana	Oblique-banded Leafroller Moth			SNR					X						
Cicindela sexguttata	Six-spotted Tiger Beetle			S5		X	X	X						X	X
Coenonympha tullia	Common Ringlet			S5		X									
Colias philodice	Clouded Sulphur			S5		X									
Ctenucha virginica	Virginia Ctenucha			S5		X	X	X							
Cupido comyntas	Eastern Tailed-Blue			S5		X									
Danaus plexippus	Monarch	SC	SC	S2N, S4B	Caterpillars on milkweed, adults nectaring on wildflowers	X	X	X						X	X
Erynnis baptisiae	Wild Indigo Duskywing			S4		X									
Limenitis archippus	Viceroy			S5		X									
Malacosoma americanum	Eastern Tent Caterpillar			S5				X							
Melandrena sp.	Mining bee species					X									
Nymphalis antiopa	Mourning Cloak			S5		X		X	X						
Pantala flavescens	Wandering Glider			S4		X									
Phyciodes cocyta	Northern Crescent			S5		X									
Pieris rapae	Cabbage White			SNA		X									
Polygonia comma	Eastern Comma			S5					X						

SCIENTIFIC NAME	COMMON NAME	STATUS			COMMENTS	VEGETATION COMMUNITY WHERE FOUND									
		SARA	ESA	SRANK		CUM	CUS	CUT	FOD	MAM	MAS	SWD	SWT	TPO	TPS
Tachinomyia sp.	Tachninid fly species					X									
Tramea lacerata	Black Saddlebags			S4		X									
Vanessa atalanta	Red Admiral			S5		X			X						
Vanessa sp.	Painted or American Lady			S5					X						
Xylocopa virginica	Eastern Carpenter Bee			S5		X									

Appendix C Significant Wildlife Habitat Review

Definitions:

Ecosite – Vegetation community type determined using the Ecological Land Classification (ELC) System for Southern Ontario (Lee et al., 1998)

SWH – Significant Wildlife Habitat

Candidate SWH – Criteria which an area must satisfy in order to potentially qualify as SWH. For areas identified as potential SWH, further studies should be conducted to confirm whether it is SWH

Presence of SWH in EA Study Area – Evaluation of whether the SWH type is present in Kilally Meadows ESA. 'Absent' indicates that no part of the study area satisfies the criteria for that SWH; 'Candidate' indicates that a portion of the study area satisfies the criteria for Candidate SWH; 'Confirmed' indicates that a portion of the study area satisfies the criteria for that SWH type.

Table C1. Significant Wildlife Habitat Screening

Habitat Type	Wildlife Species	Candidate SWH		Confirmed SWH	Presence of Habitat in Kilally Meadows ESA
		ELC Ecosite Codes	Criteria and Information Sources	Defining Criteria	
Seasonal Concentration Areas of Animals					
Waterfowl Stopover and Staging Areas (Terrestrial) Rationale – Habitat important to migrating waterfowl.	American Black Duck Northern Pintail Gadwall Blue-winged Teal Green-winged Teal American Wigeon Northern Shoveler Tundra Swan	CUM1 CUT1 Plus evidence of annual spring flooding from meltwater or run-off within these Ecosites. Fields with seasonal flooding and waste grains in the Long Point, Rondeau, Lake St. Clair, Grand Bend and Point Pelee areas may be important to Tundra Swans	CRITERIA • Fields with sheet water during Spring (mid- March to May) • Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl • Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless they have spring sheet water available INFORMATION SOURCES • Anecdotal information from the landowner, adjacent landowners or local naturalist clubs may be good information in determining occurrence. • Reports and other information available from Conservation Authorities • Sites documented through waterfowl planning processes • Field Naturalist Clubs • Ducks Unlimited Canada • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • Any mixed species aggregations of 100 or more individuals required • The flooded field ecosite habitat plus a 100- 300m radius, dependent on local site conditions and adjacent land use is the Significant Wildlife Habitat • Annual use of habitat is documented from information sources or field studies (annual use can be based on studies or determined by past surveys with species numbers and dates) • SWH MIST Index #7 provides development effects and mitigation measures.	ABSENT – No suitable open fields containing spring sheet water are present in the ESA. Indicator species were only observed as flyovers.
Waterfowl Stopover and Staging Areas (Aquatic) Rationale – Important for local and migrant waterfowl populations during the spring	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	MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7	CRITERIA • Ponds, marshes, lakes, bays, coastal inlets and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify • These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water).	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 SWH • The combined area of the ELC ecosites and a 100m radius area is the SWH • Wetland area and shorelines associated with sites identified within the SWHTG	CANDIDATE – Thames River could potentially be an important stopover area for waterfowl. Many of the indicator species have been reported during migration on eBird. Detail migrant waterfowl surveys would be required to confirm whether this habitat is present.

Habitat Type	Wildlife Species	Candidate SWH		Confirmed SWH	Presence of Habitat in Kilally Meadows ESA
		ELC Ecosite Codes	Criteria and Information Sources	Defining Criteria	
or fall migration or both periods combined. Sites identified are usually only one of a few in the eco-district.	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 Brant Canvasback Ruddy Duck		INFORMATION SOURCES • Environment Canada • Naturalist clubs often are aware of staging/stopover areas. • OMNRF Wetland Evaluations indicate presence of locally and regionally significant waterfowl staging. • Sites documented through waterfowl planning processes • Ducks Unlimited projects • Element occurrence specification by Nature Serve: http://www.natureserve.org • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	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). • SWH MIST Index #7 provides development effects and mitigation measures.	
Shorebird Migratory Stopover Areas 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	BBO1 BBO2 BBS1 BBS2 BBT1 BBT2 SDO1 SDS2 SDT1 MAM1 MAM2 MAM3 MAM4 MAM5	CRITERIA • 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 SWH. INFORMATION SOURCES • Western hemisphere shorebird reserve network • Canadian Wildlife Service (CWS) Ontario Shorebird Survey • Bird Studies Canada • Ontario Nature • Local birders and naturalist clubs	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 ELC shoreline ecosites plus a 100m radius area • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • SWH MIST Index #8 provides development effects and mitigation measures.	CANDIDATE – Difficult to rule out the presence of this SWH type since indicator species were observed by Parsons and have been reported on eBird. However, it is extremely unlikely that the requisite number of shorebirds stop over in the ESA during migration. If present, shorebird migratory stopover areas would be located along the Thames River.

Habitat Type	Wildlife Species	Candidate SWH		Confirmed SWH	Presence of Habitat in Kilally Meadows ESA
		ELC Ecosite Codes	Criteria and Information Sources	Defining Criteria	
	Ruddy Turnstone Sanderling Dunlin		• Natural Heritage Information Centre (NHIC) Shorebird Migratory Concentration Area		
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 ELC 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).	CRITERIA • 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 INFORMATION SOURCES • OMNRF Ecologist or Biologist • Naturalist clubs • Natural Heritage Information Centre (NHIC) 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 sue of these habitats by: • One or more Short-eared Owls or; one of 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" • SWH MIST Index #10 and #11 provides development effects and mitigation measures.	CANDIDATE – The combination of forest and open country communities in the ESA, and winter reports of several indicator species on eBird, mean that the site could be a raptor wintering area. Detailed winter raptor surveys would be needed to confirm whether this SWH is present.
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 SWH)	CRITERIA • Hibernacula may be found in caves, mine shafts, underground foundations and Karsts • Active mine sites should not be considered as SWH	• All sites with confirmed hibernating bats are SWH • The area includes 200 m radius around the entrance of the hibernaculum for most development types and 1000 m for wind farms	ABSENT – No caves, mine shafts, underground foundations or other suitable structures are present in the ESA.

Habitat Type	Wildlife Species	Candidate SWH		Confirmed SWH	Presence of Habitat in Kilally Meadows ESA
		ELC Ecosite Codes	Criteria and Information Sources	Defining Criteria	
			• The locations of Bat Hibernacula are relatively poorly known. • INFORMATION SOURCES • OMNRF for possible locations and contact for local experts • Natural Heritage Information Centre (NHIC) Bat Hibernaculum • Ministry of Northern Development and Mines for location of mine shafts. • Clubs that explore caves (eg. Sierra Club) • University Biology Departments with bat experts.	• 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" • SWH MIST Index #1 provides development effects and mitigation measures.	
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 SWH are found in forested Ecosites. All ELC Ecosites in ELC Community Series: FOD, FOM, SWD, SWM	CRITERIA • Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH). • 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 INFORMATION SOURCES • OMNRF for possible locations and contact for local experts	Maternity colonies with confirmed use by: • >10 Big Brown Bats • >5 adult female Silver-haired Bats • The area of habitat includes the entire woodland or a forest stand ELC 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" • SWH MIST Index #12 provides the development effects and mitigation measures.	ABSENT – Although Big Brown Bat/Silver-haired Bat were recorded in the ESA, no concentrations of snag trees suitable for maternity colonies were noted.

Habitat Type	Wildlife Species	Candidate SWH		Confirmed SWH	Presence of Habitat in Kilally Meadows ESA
		ELC Ecosite Codes	Criteria and Information Sources	Defining Criteria	
			• University Biology Departments with bat experts.		
Reptile Hibernaculum Rationale – Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant.	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.	CRITERIA • 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 SWH. • 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. INFORMATION SOURCES • 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 (NHIC)	• 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 (eg. 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 SWH • 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 SWH • SWH MIS Index #13 provides development effects and mitigation measures for snake hibernacula.	ABSENT – No concentrations of snakes were observed during field investigations.
Colonially-Nesting Bird	Cliff Swallow Northern Rough-winged Swallow (this	Eroding banks, sandy hills, borrow pits, steep slopes, and	CRITERIA • Any site or areas with exposed soil banks, undisturbed or naturally eroding	Studies confirming: • Presence of 1 or more nesting sites with 8 or more cliff swallow pairs and/or	ABSENT – Although Northern Rough-winged Swallows were observed foraging over Kilally

Habitat Type	Wildlife Species	Candidate SWH		Confirmed SWH	Presence of Habitat in Kilally Meadows ESA
		ELC Ecosite Codes	Criteria and Information Sources	Defining Criteria	
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 populations are declining in Ontario.	species is not colonial but can be found in Cliff Swallow colonies)	sand piles Cliff faces, bridge abutments, silos, barns. Habitat found in the following ecosites: CUM1 CUT1 CUS1 BLO1 BLS1 BLT1 CLO1 CLS1 CLT1	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. INFORMATION SOURCES • Reports and other information available from Conservation Authorities • Ontario Breeding Bird Atlas • Bird StudiesCanada *NatureCounts* • http://www.birdscanada.org/birdmon • Field Naturalist Clubs	rough-winged swallow pairs during the breeding season. • A colony identified as SWH 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" • SWH MIST Index #4 provides development effects and mitigation measures.	Meadows during breeding bird surveys, no nesting sites were located in the study area. There may be exposed banks along the Thames River were Northern Rough-winged Swallow could nest. Bridges adjacent to the ESA (e.g. Highbury Avenue and Adelaide Street) are potentially habitat for Cliff Swallow.
Colonially-Nesting Bird Breeding Habitat (Tree/Shrubs) Rationale – Large colonies are important to local bird populations, 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	CRITERIA • 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. INFORMATION SOURCES • Ontario Breeding Bird Atlas colonial nest records. • Ontario Heronry Inventory 1991 available from Bird Studies Canada or NHIC (OMNRF). • Natural Heritage Information Centre (NHIC) Mixed Wader Nesting Colony • Aerial photographs can help identify large heronries. • Reports and other information available from Conservation Authorities.	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 SWH • 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 • SWH MIST Index #5 provides development effects and mitigation measures.	ABSENT – No heron nests were observed in the study area during breeding bird surveys.

Habitat Type	Wildlife Species	Candidate SWH		Confirmed SWH	Presence of Habitat in Kilally Meadows ESA
		ELC Ecosite Codes	Criteria and Information Sources	Defining Criteria	
			• MNRF District Offices • Field Naturalist Clubs.		
Colonially-Nesting Bird Breeding Habitat (Ground) Rationale – Colonies are important to local bird populations, 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	CRITERIA • 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. INFORMATION SOURCES • Ontario Breeding Bird Atlas, rare/colonial species records. • Canadian Wildlife Service • Reports and other information available from Conservation Authorities. • Natural Heritage Information Centre (NHIC) Colonial Waterbird Nesting Area • MNRF 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 ELC ecosites containing the colony or any island <3 ha with a colony is the SWH • Studies would be done during May/June when actively nesting. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • SWH MIST Index #6 provides development effects and mitigation measures.	ABSENT – No nests belonging to any of the listed bird species were identified in the ESA during breeding bird surveys.
Migratory Butterfly Stopover Areas Rationale – Butterfly stopover areas are extremely rare habitats and are biologically important for butterfly species	Painted Lady Red Admiral SPECIAL CONCERN Monarch	Combination of ELC Community Series; need to have present one Community Series from each land class: FIELD: CUM, CUT, CUS FOREST: FOC, FOD, FOM, CUP	CRITERIA • 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	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	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.

Habitat Type	Wildlife Species	Candidate SWH		Confirmed SWH	Presence of Habitat in Kilally Meadows ESA
		ELC Ecosite Codes	Criteria and Information Sources	Defining Criteria	
that migrate south for the winter.		Anecdotally, a candidate site for butterfly stopover will have a history of butterflies being observed.	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 INFORMATION SOURCES • MNRF District Offices • Natural Heritage Information Centre (NHIC) • Agriculture Canada in Ottawa may have list of butterfly experts. • Field Naturalist Clubs • Toronto Entomologists Association	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. • SWH MIST Index #16 provides development effects and mitigation measures.	
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 ELC Community Series: FOC FOM FOD SWC SWM SWD	CRITERIA • 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 SWH. INFORMATION SOURCES • Bird Studies Canada • Ontario Nature	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" • SWH MIST Index #9 provides development effects and mitigation measures.	ABSENT – The ESA is not located within 5 km of Lake Erie and is therefore not eligible to be significant landbird migratory stopover habitat.

Habitat Type	Wildlife Species	Candidate SWH		Confirmed SWH	Presence of Habitat in Kilally Meadows ESA
		ELC Ecosite Codes	Criteria and Information Sources	Defining Criteria	
			• Local birders and field naturalist clubs • Ontario Important Bird Areas (IBA) Program		
Deer Winter Congregation Areas Rationale – 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 to reduce or avoid the impacts of winter conditions.	White-tailed Deer	All forested Ecosites with these ELC Community Series: FOC, FOM, FOD, SWC, SWM, SWD Conifer plantations much smaller than 50 ha may also be used.	CRITERIA • 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. INFORMATION SOURCES • MNRF District Offices • LIO/NRVIS	Studies confirm: • Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF • Use of the woodlot by white-tailed deer will be determined by MNRF, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNRF • 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 • SWH MIST Index #2 provides development effects and mitigation measures	ABSENT – MNRF did not indicate that any deer winter congregation areas are present in the ESA.
RARE VEGETATION COMMUNITIES					
Cliffs and Talus Slopes Rationale – Cliffs and Talus Slopes are extremely rare habitats in Ontario.		Any ELC 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.	CRITERIA • Most cliff and talus slopes occur along the Niagara Escarpment INFORMATION SOURCES • The Niagara Escarpment Commission has detailed information on location of these habitats • OMNRF Districts • Natural Heritage Information Centre (NHIC) has location information available on their website • Field Naturalist Clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Cliffs or Talus Slopes • SWH MIST Index #21 provides development effects and mitigation measures	ABSENT – None of the listed Ecosites are present in the ESA.

Habitat Type	Wildlife Species	Candidate SWH		Confirmed SWH	Presence of Habitat in Kilally Meadows ESA
		ELC Ecosite Codes	Criteria and Information Sources	Defining Criteria	
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.		ELC 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%.	CRITERIA • A sand barren area >0.5 ha in size • INFORMATION SOURCES • The Niagara Escarpment Commission has detailed information on location of these habitats • OMNRF Districts • Natural Heritage Information Centre (NHIC) has location information available on their website • Field Naturalist Clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Sand Barrens • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic spp.) • SWH MIST Index #20 provides development effects and mitigation measures	ABSENT – None of the listed Ecosites are present in the ESA.
Alvar Rationale – Alvars are extremely rare habitats in Ecoregion 7E.	Five Alvar Indicator Species: Carex crawei Panicum philadelphicum Eleocharis compressa Scutellaria parvula Trichostema brachiatum These indicator species are very specific to Alvars within Ecoregion 7E	ALO1, ALS1, ALT1, FOC1, FOC2, CUM2, CUS2, CUT2-1, CUW2 An Alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain	CRITERIA • 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 INFORMATION SOURCES • Alvars of Ontario (Federation of Ontario Naturalists, 2000)	• 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	ABSENT – None of the listed Ecosites or indicator species are present in the ESA.

Habitat Type	Wildlife Species	Candidate SWH		Confirmed SWH	Presence of Habitat in Kilally Meadows ESA
		ELC Ecosite Codes	Criteria and Information Sources	Defining Criteria	
		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	• Conserving Great Lakes Alvars (Ontario Nature) • OMNRF Districts • Natural Heritage Information Centre (NHIC) has location information available on their website • Field Naturalist Clubs • Conservation Authorities	• SWH MIST Index #17 provides development effects and mitigation measures	
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	CRITERIA • Woodland area is >0.5 ha INFORMATION SOURCES • OMNRF Forest Resource Inventory mapping • OMNRF 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 SWH • 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 eco- element within an ecosite that contain the old growth characteristics is the SWH	ABSENT – Occasional trees estimated to be older than 140 years were found at several locations in the ESA. But no forest communities with frequent old growth trees, snags, canopy gaps or multi-layered canopy structure were identified.

Habitat Type	Wildlife Species	Candidate SWH		Confirmed SWH	Presence of Habitat in Kilally Meadows ESA
		ELC Ecosite Codes	Criteria and Information Sources	Defining Criteria	
		snags and downed woody debris.		• Determine ELC vegetation types for the forest area containing the old growth characteristics • SWH MIST Index #23 provides development effects and mitigation measures	
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).	CRITERIA • No minimum size to site • Site must be restored or a natural site. Remnant sites such as railway right-of-ways are not considered SWH INFORMATION SOURCES • Natural Heritage Information Centre (NHIC) 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 ELC Ecosite is the SWH • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic spp.) • SWH MIST Index #18 provides development effects and mitigation measures.	CONFIRMED – There is one tallgrass savannah ecosite in Kilally Meadows and the presence of large bur oaks and prairie grasses in other vegetation communities suggests that tallgrass savannahs were once more abundant in the ESA.
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.	CRITERIA • No minimum size to site • Site must be restored or a natural site. Remnant sites such as railway right-of-ways are not considered SWH INFORMATION SOURCES • Natural Heritage Information Centre (NHIC) has location information available on their website	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 ELC Ecosite is the SWH • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic spp.)	CONFIRMED –There is one tallgrass prairie ecosite in Kilally Meadows and the presence of prairie grasses (e.g. Indian Grass, Big Bluestem, Little Bluestem, Switchgrass) and other prairie species elsewhere in the ESA suggests that tallgrass prairies and savannahs were once more abundant in the ESA.

Habitat Type	Wildlife Species	Candidate SWH		Confirmed SWH	Presence of Habitat in Kilally Meadows ESA
		ELC Ecosite Codes	**Criteria and Information Sources**	**Defining Criteria**	
		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).	• Field Naturalist Clubs • Conservation Authorities	• SWH MIST Index #19 provides development effects and mitigation measures.	
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 (MNRF, 2000). Any ELC Ecosite Code that has a possible ELC Vegetation Type that is provincially rare is candidate SWH. Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps.	CRITERIA • ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in Appendix M of the Significant Wildlife Habitat Technical Guide (MNRF, 2000). • MNRF/NHIC will have up to date listing for rare vegetation communities. INFORMATION SOURCES • Natural Heritage Information Centre (NHIC) has location information available on their website • Field Naturalist Clubs • Conservation Authorities	• Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of the Significant Wildlife Habitat Technical Guide (MNRF, 2000). • Area of the ELC Vegetation Type polygon is the SWH. • SWH MIST Index #37 provides development effects and mitigation measures.	ABSENT – No other rare vegetation communities were identified in the ESA.
SPECIALIZED HABITAT FOR WILDLIFE					
Waterfowl Nesting Area Rationale – Important to local waterfowl populations, sites	American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal	All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1, MAS2, MAS3, SAS1, SAM1, SAF1,	CRITERIA • 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	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.	ABSENT –No nesting waterfowl were observed in the ESA during breeding bird surveys or other field visits.

Habitat Type	Wildlife Species	Candidate SWH		Confirmed SWH	Presence of Habitat in Kilally Meadows ESA
		ELC Ecosite Codes	Criteria and Information Sources	Defining Criteria	
with greatest number of species and highest number of individuals are significant	Wood Duck Hooded Merganser Mallard	MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SWT1, SWT2, SWD1, SWD2, SWD3, SWD4 NOTE Includes adjacency to Provincially Significant Wetlands	120 m of each individual wetland where waterfowl nesting is known to occur	• Any active nesting site of an American Black Duck is considered significant.	
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat Rationale – Nest sites are fairly uncommon in Ecoregion 7E and are used annually by these species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat.	Osprey SPECIAL CONCERN Bald Eagle	ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands.	CRITERIA • 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 SWH (e.g. telephone poles and constructed nesting platforms) INFORMATION SOURCES • NHIC compiles all known nesting sites for Bald Eagles in Ontario • MNRF 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. • OMNRF District. • Check the Ontario Breeding Bird Atlas or Rare Breeding Birds in Ontario for species documented	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 SWH. • For an Osprey, the active nest and a 300 m radius around the nest or the contiguous woodland stand is the SWH, 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 SWH. 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.	ABSENT – Although there is an Osprey nest present on top of a floodlight next to a baseball diamond adjacent to Kilally Meadows ESA, the nest cannot be included as SWH because it is located on a man-made structure.

Habitat Type	Wildlife Species	Candidate SWH		Confirmed SWH	Presence of Habitat in Kilally Meadows ESA
		ELC Ecosite Codes	Criteria and Information Sources	Defining Criteria	
			• Reports and other information available from Conservation Authorities. • Field Naturalists clubs	• Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • SWH MIST Index #26 provides development effects and mitigation measures	
Woodland Raptor Nesting Habitat Rationale – Nest sites for these species are rarely identified; these area sensitive habitats 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 ELC Ecosites. May also be found in SWC, SWM, SWD and CUP3.	CRITERIA • 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 INFORMATION SOURCES • OMNRF 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 areaof habitat is the SWH. 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 SWH • Broad-winged Hawk and Coopers Hawk, – A 100m radius around the nest is the SWH • Sharp-Shinned Hawk – A 50m radius around the nest is the SWH • 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. • SWH MIST Index #27 provides development effects and mitigation measures	ABSENT –Surveys did not identify any raptor nests in the ESA.
Seeps and Springs Rationale – Seeps/springs are typical of headwater areas	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	CRITERIA • 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	Field studies confirm: • Presence of a site with 2 or more seeps/springs should be considered SWH. • The area of a ELC forest ecosite or an ecoelement within ecosite containing the seeps/springs is the SWH. The protection	ABSENT – No seeps or springs were identified in the ESA through field or background studies.

Habitat Type	Wildlife Species	Candidate SWH		Confirmed SWH	Presence of Habitat in Kilally Meadows ESA
		ELC Ecosite Codes	Criteria and Information Sources	Defining Criteria	
and are often at the source of coldwater streams.		habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	in the winter will support a variety of plant and animal species. INFORMATION SOURCES • 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	of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation the habitat • SWH MIST Index #30 provides development effects and mitigation measures	
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 ELC 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.	CRITERIA • Presence of a wetland, pond or woodland pool (including vernal pools) >500 m^2 (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. INFORMATION SOURCES • 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. • OMNRF Districts and wetland evaluations • Field Naturalist clubs • Canadian Wildlife Service Amphibian Road Call Survey	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. • SWH MIST Index #14 provides development effects and mitigation measures	CONFIRMED – Amphibian breeding surveys identified significant amphibian breeding habitat, woodland type, in Kilally Meadows that contained over 20 calling individuals of two indicator species: Spring Peeper and Western Chorus Frog.

Habitat Type	Wildlife Species	Candidate SWH		Confirmed SWH	Presence of Habitat in Kilally Meadows ESA
		ELC Ecosite Codes	Criteria and Information Sources	Defining Criteria	
			• Ontario Vernal Pool Association: http://www.ontariovernalpools.org		
Amphibian Breeding Habitat (Wetland) 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	ELC 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.	CRITERIA • Wetlands >500m2 (about 25m diameter), supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNRF 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. INFORMATION SOURCES • Ontario Herpetofaunal Summary Atlas (or other similar atlases) • Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count. • OMNRF 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 ELC ecosite wetland area and the shoreline are the SWH • 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 SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWH MIST Index #15 provides development effects and mitigation measures.	CANDIDATE – Well over 20 American Toads were heard calling in habitat adjacent to the Thames River within the hydro corridor and across from Windermere Road. However, because American Toad was the only species calling at this location, it does not fulfill the criteria for SWH.
Woodland Area-Sensitive Bird Breeding Habitat Rationale – Large, natural blocks of mature woodland habitat within the settled areas of	Yellow-bellied Sapsucker Red-breasted Nuthatch Veery Blue-headed Vireo Northern Parula Black-throated Green Warbler Blackburnian Warbler	All Ecosites associated with these ELC Community Series: FOC, FOM, FOD, SWC, SWM, SWD	CRITERIA • 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	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 SWH • Conduct field investigations in spring and early summer when birds are singing and defending their territories	ABSENT – Interior forest habitat is not present in the ESA. Several indicator species were observed during migration but do not breed in the ESA.

Habitat Type	Wildlife Species	Candidate SWH		Confirmed SWH	Presence of Habitat in Kilally Meadows ESA
		ELC Ecosite Codes	Criteria and Information Sources	Defining Criteria	
Southern Ontario are important habitats for area sensitive interior forest song birds.	Black-throated Blue Warbler Ovenbird Scarlet Tanager Winter Wren Pileated Woodpecker SPECIAL CONCERN Cerulean Warbler Canada Warbler		• 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.	• Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • SWH MIST Index #34 provides development effects and mitigation measures	
HABITAT OF SPECIES OF CONSERVATION CONCERN					
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	CRITERIA • 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 INFORMATION SOURCES • OMNRF District and wetland evaluations. • Field Naturalist clubs • Natural Heritage Information Centre (NHIC) 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 SWH • Area of the ELC ecosite is the SWH. • 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" • SWH MIST Index #35 provides development effects and mitigation measures	ABSENT – Breeding bird surveys did not identify any of the listed species in the ESA.
Open Country Bird Breeding Habitat	Upland Sandpiper Grasshopper Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow	CUM1, CUM2	CRITERIA • Large grassland areas (includes natural and cultural fields and meadows) >30 ha	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 SWH	ABSENT – Breeding bird surveys did not identify any of the listed species in the ESA.

Habitat Type	Wildlife Species	Candidate SWH		Confirmed SWH	Presence of Habitat in Kilally Meadows ESA
		ELC Ecosite Codes	Criteria and Information Sources	Defining Criteria	
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.	SPECIAL CONCERN Short-eared Owl		• 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 INFORMATION SOURCES • Agricultural land classification maps, Ministry of Agriculture. • Local bird clubs. • Ontario Breeding Bird Atlas • EIS Reports and other information available from Conservation Authorities	• The area of SWH is the contiguous ELC 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" • SWH MIST Index #32 provides development effects and mitigation measures	
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	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	CRITERIA • 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	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 SWH is the contiguous ELC 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	CANDIDATE – Breeding bird surveys identified two common species (Field Sparrow and Willow Flycatcher) in thicket communities in the ESA. However, none of the uncommon indicator species were observed and thicket type communities in the study area are therefore only candidate shrub/early-successional bird breeding habitat.

Habitat Type	Wildlife Species	Candidate SWH		Confirmed SWH	Presence of Habitat in Kilally Meadows ESA
		ELC Ecosite Codes	Criteria and Information Sources	Defining Criteria	
(2004) trend records.			INFORMATION SOURCES • Agricultural land classification maps, Ministry of Agriculture. • Local bird clubs. • Ontario Breeding Bird Atlas • Reports and other information available from Conservation Authorities	• Habitats: Guidelines for Wind Power Projects" • SWH MIST Index #33 provides development effects and mitigation measures	
Terrestrial Crayfish Rationale – Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats are very rare.	Chimney or Digger Crayfish Devil Crayfish or Meadow Crayfish	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	CRITERIA • 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. INFORMATION SOURCES • 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 ELC ecosite or an ecoelement area of meadow marsh or swamp within the larger ecosite area is the SWH • 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 • SWH MIST Index #36 provides development effects and mitigation measures	ABSENT – Terrestrial crayfish burrows were not found in the ESA.
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 NHIC	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.	CRITERIA • 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 ELC Ecosites INFORMATION SOURCES • Natural Heritage Information Centre (NHIC) will have Special Concern and	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 ELC scale that protects the habitat form and function is the SWH, this must be delineated through detailed field studies. The habitat needs be easily mapped and cover an important life	CONFIRMED – The following Special Concern species were observed in the study area: Soft Hairy False Gromwell – Habitat for this species is tallgrass prairie and meadow. Great Plains Ladies'-tresses – Habitat for this species is tallgrass prairie and meadow.

Habitat Type	Wildlife Species	Candidate SWH		Confirmed SWH	Presence of Habitat in Kilally Meadows ESA
		ELC Ecosite Codes	Criteria and Information Sources	Defining Criteria	
			Provincially Rare (S1-S3, SH) species lists with element occurrences data. • NHIC 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	stage component for a species e.g. specific nesting habitat or foraging habitat. • SWH MIST Index #37 provides development effects and mitigation measures	Striped Cream Violet – Habitat for this species is fresh-moist lowland deciduous forest. Eastern Wood-pewee – All forest communities in the ESA are potential nesting habitat for this species. Wood Thrush – All forest communities in the ESA are potential nesting habitat for this species. Hackberry Emperor – Habitat for this species is any ecosite containing Northern Hackberry. Monarch – Habitat for this species is any ecosite containing milkweed.
ANIMAL MOVEMENT CORRIDORS					
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	CRITERIA • Movement corridors between breeding habitat and summer habitat • Movement corridors must be determined when amphibian breeding habitat is confirmed as SWH (Amphibian Breeding Habitat, Wetland) INFORMATION SOURCES • MNRF District Office. • Natural Heritage Information Centre (NHIC). • 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	CANDIDATE –There may be amphibian movement corridors between wetland features with breeding amphibians and surrounding forest habitat.

Habitat Type	Wildlife Species	Candidate SWH		Confirmed SWH	Presence of Habitat in Kilally Meadows ESA
		ELC Ecosite Codes	Criteria and Information Sources	Defining Criteria	
				• SWH MIST Index #40 provides development effects and mitigation measures	

Appendix D: Restoration Overlays and Priorities by Polygon

Definitions:

Polygon No. – Refer to Map 4 in Appendix A

Community Series – Existing community series: TPO – Tallgrass Prairie, TPS – Tallgrass Savannah, FOD – Deciduous Forest, CUM – Cultural Meadow, CUT – Cultural Thicket, CUS – Cultural Savannah, MAM – Meadow Marsh, MAS – Shallow Marsh, SWD – Deciduous Swamp, SWT – Thicket Swamp

SAR/SWH/RR Species – Species at Risk, Significant Wildlife Habitat, and/or regionally rare species are present Restoration Overlay – See Map 4 in Appendix A

Target Community Series – Vegetation community to which the polygon should be restored Restoration Priority – Timeline within which restoration activities should begin

Table D1. Restoration Overlays and Priorities by Polygon

Polygon Number	Area (Ha)	Community Series (2018)	Buckthorn (% Cover 2018)	Dog-strangling Vine (% Cover 2018)	Other Invasives (% Cover 2018)	SAR / SWH / RR Species	Restoration Overlay	Target Community Series	Restoration Tasks	Restoration Priority
1	8.81	FOD	50	10	10	• Habitat for Striped Cream Violet (S3) • Habitat for Eastern Wood-pewee (SC) • Habitat for Hackberry Emperor (S3) • Habitat for One-flowered Cancer-root (RR)	4c	Forest	• Manage buckthorn • Manage Dog-strangling Vine • Manage daylilies, garlic mustard • Consider planting native trees and woodland plants in cleared areas	2 (Medium)
2	0.24	SWT	0	0	20		1a	Wetland	• Manage invasive willows • Manage other invasives	1 (High)
3	0.92	CUM	5	0	80	• Habitat for Monarch Butterfly (SC)	2b	Prairie / Meadow	• Manage buckthorn • Manage Eastern Hedge Bedstraw • Manage cool season grasses and other invasives • Plant native prairie species • Consider using controlled burn	2 (Medium)
4	1.74	CUT	5	0	0		4a	Forest	• Manage buckthorn • Consider planting native trees and woodland plants in cleared areas	1 (High)
5	5.54	FOD	80	20	15	• Habitat for Eastern Wood-pewee (SC) • Habitat for Hackberry Emperor (S3)	4c	Forest	• Manage buckthorn • Manage dog-strangling vine • Manage other invasives • Consider planting native trees and woodland plants in cleared areas	2 (Medium)
6	3.02	FOD	80	0	50	• Amphibian Breeding Habitat (Woodland) (SWH) • Habitat for Eastern Wood-pewee (SC) • Habitat for Hackberry Emperor (S3) • Habitat for Spring Clearweed (RR)	4d	Forest	• Manage buckthorn • Manage Creeping Charlie • Consider planting native trees and woodland plants in cleared areas	2 (Medium)
7	1.71	FOD	90	0	5	• Amphibian Breeding Habitat (Woodland) (SWH) • Habitat for Eastern Wood-pewee (SC) • Habitat for Hackberry Emperor (S3)	4c	Forest	• Manage buckthorn • Manage Lesser Periwinkle • Consider planting native trees and woodland plants in cleared areas	2 (Medium)

Polygon Number	Area (Ha)	Community Series (2018)	Buckthorn (% Cover 2018)	Dog-strangling Vine (% Cover 2018)	Other Invasives (% Cover 2018)	SAR / SWH / RR Species	Restoration Overlay	Target Community Series	Restoration Tasks	Restoration Priority
8	0.59	CUM	20	0	100	• Habitat for Monarch Butterfly (SC)	2b	Prairie / Meadow	• Manage Bird's-foot Trefoil, Creeping Bentgrass, knapweed, Purple Loosestrife and other invasives • Manage buckthorn • Plant native prairie species • Consider using controlled burn	2 (Medium)
9	3.90	FOD	80	30	0	• Amphibian Breeding Habitat (Woodland) (SWH) • Habitat for Eastern Wood-pewee (SC) • Habitat for Hackberry Emperor (S3)	4c	Forest	• Manage buckthorn • Manage dog-strangling vine • Manage other invasives • Consider planting native trees and woodland plants in cleared areas	2 (Medium)
10	0.75	SWT	100	0	10	• Amphibian Breeding Habitat (Woodland) (SWH)	1c	Wetland	• Manage buckthorn • Manage invasive honeysuckles • Consider seeding/live staking native willows and wetland plants	2 (Medium)
11	1.68	SWD	10	0	70	• Amphibian Breeding Habitat (Woodland) (SWH)	1b	Wetland	• Manage invasive willows • Manage buckthorn • Consider seeding/live staking native willows and wetland plants	2 (Medium)
12	0.80	CUT	75	0	0	• Amphibian Breeding Habitat (Woodland) (SWH)	4c	Forest	• Manage buckthorn • Consider planting native trees and woodland plants in cleared areas	2 (Medium)
13	0.31	SWT	0	0	10	• Amphibian Breeding Habitat (Woodland) (SWH)	1a	Wetland	• Manage invasive willows	1 (High)
14	0.92	SWT	100	0	5		1c	Wetland	• Manage buckthorn • Remove large Norway Spruce • Consider seeding/live staking native willows and wetland plants	2 (Medium)
15	3.47	CUM/CUT	50	50	0	• Habitat for Great Plains Ladies'-tresses (S3) • Habitat for Soft-hairy False Gromwell (S2) • Habitat for Monarch Butterfly (SC)	2d	Prairie / Meadow	• Manage buckthorn • Manage Dog-strangling Vine • Plant native prairie species	1 (High)

Polygon Number	Area (Ha)	Community Series (2018)	Buckthorn (% Cover 2018)	Dog-strangling Vine (% Cover 2018)	Other Invasives (% Cover 2018)	SAR / SWH / RR Species	Restoration Overlay	Target Community Series	Restoration Tasks	Restoration Priority
						• Habitat for Fragrant Sumac (RR) • Habitat for Hoary Vervain (RR) • Habitat for Smooth Horsetail (RR)			• Consider using controlled burn	
16	0.86	TPO	20	5	0	• Tallgrass Prairie (SWH) • Habitat for Soft-hairy False Gromwell (S2) • Habitat for Monarch Butterfly (SC) • Habitat for Smooth Horsetail (RR)	2a	Prairie / Meadow	• Manage buckthorn • Manage Dog-strangling Vine • Consider using controlled burn	1 (High)
17	0.18	SWT	100	0	0	• Habitat for Marsh Horsetail (RR)	1c	Wetland	• Manage buckthorn • Consider seeding/live staking native willows and wetland plants	2 (Medium)
18	0.99	SWT	100	0	0		1c	Wetland	• Manage buckthorn • Consider seeding/live staking native willows, dogwoods and wetland plants	2 (Medium)
19	4.24	CUM/CUT	50	50	0	• Habitat for Soft-hairy False Gromwell (S2) • Habitat for Monarch Butterfly (SC) • Habitat for Smooth Horsetail (RR) • Habitat for Hoary Vervain (RR)	2d	Prairie / Meadow	• Manage buckthorn • Manage Dog-strangling Vine • Plant native prairie species • Consider using controlled burn	1 (High)
20	5.62	FOD	80	80	0	• Habitat for Eastern Wood-pewee (SC) • Habitat for Hackberry Emperor (S3) • Habitat for One-flowered Cancer-root (RR)	4e	Forest	• Manage buckthorn • Manage Dog-strangling Vine • Consider planting native trees and woodland plants in cleared areas	2 (Medium)
21	2.58	CUM	20	0	0	• Habitat for Monarch Butterfly (SC)	2a	Prairie / Meadow	• Manage buckthorn • Plant native prairie species • Consider using controlled burn	1 (High)
22	1.92	FOD	50	0	0	• Habitat for Eastern Wood-pewee (SC) • Habitat for Hackberry Emperor (S3) • Habitat for Red-rooted Flatsedge (RR) • Habitat for Philadelphia Panicgrass (RR)	4c	Forest	• Manage buckthorn • Plant native trees and woodland plants in cleared areas	2 (Medium)

Polygon Number	Area (Ha)	Community Series (2018)	Buckthorn (% Cover 2018)	Dog-strangling Vine (% Cover 2018)	Other Invasives (% Cover 2018)	SAR / SWH / RR Species	Restoration Overlay	Target Community Series	Restoration Tasks	Restoration Priority
23	0.22	SWD	80	20	0		1c	Wetland	• Manage buckthorn • Manage Dog-strangling Vine • Consider seeding/live staking native willows, dogwoods and wetland plants	2 (Medium)
24	0.39	MAM	0	20	0		1a	Wetland	• Manage dog-strangling vine	1 (High)
25	2.18	CUM/CUT	80	90	100	• Habitat for Monarch Butterfly (SC) • Habitat for Whorled Milkweed (RR)	2e	Prairie / Meadow	• Manage buckthorn • Manage Dog-strangling Vine • Manage cool season grasses • Plant native prairie species • Consider using controlled burn	3 (Low)
26	1.15	FOD	0	10	50	• Habitat for Eastern Wood-pewee (SC) • Habitat for Hackberry Emperor (S3)	4b	Forest	• Manage Dog-strangling Vine • Manage Creeping Charlie • Consider planting native trees and woodland plants in cleared areas	2 (Medium)
27	2.60	TPS/CUT	50	50	0	• Tallgrass Savannah (SWH) • Habitat for Soft-hairy False Gromwell (S2) • Habitat for Monarch Butterfly (SC) • Habitat for Smooth Horsetail (RR) • Habitat for Hoary Vervain (RR)	3b	Savannah	• Manage buckthorn • Manage Dog-strangling Vine Plant native prairie species Consider using controlled burn	1 (High)
28	1.19	MAM	0	0	40	• Habitat for Floating-leaved Pondweed	1a	Wetland	• Manage Lesser Celandine Manage invasive willows	1 (High)
29	6.34	FOD	70	60	35	• Habitat for Eastern Wood-pewee (SC) • Habitat for Hackberry Emperor (S3)	4e	Forest	• Manage buckthorn • Manage Dog-strangling Vine • Manage Crown Vetch, daylilies, Himalayan Balsam, and other invasives • Consider planting native trees and woodland plants in cleared areas	2 (Medium)
30	3.96	FOD	20	0	5	• Habitat for Eastern Wood-pewee (SC) • Habitat for Hackberry Emperor (S3)	4a	Forest	• Manage buckthorn	1 (High)

Polygon Number	Area (Ha)	Community Series (2018)	Buckthorn (% Cover 2018)	Dog-strangling Vine (% Cover 2018)	Other Invasives (% Cover 2018)	SAR / SWH / RR Species	Restoration Overlay	Target Community Series	Restoration Tasks	Restoration Priority
									• Manage Himalayan Balsam and other invasives • Consider planting native trees and woodland plants in cleared areas	
31	9.21	FOD	10	0	50	• Habitat for Eastern Wood-pewee (SC) • Habitat for Hackberry Emperor (S3)	4b	Forest	• Manage Goutweed Manage buckthorn • Consider planting native trees and woodland plants in cleared areas	2 (Medium)
32	4.30	CUM/CUT	10	0	75	• Habitat for Monarch Butterfly (SC)	2b	Prairie / Meadow	• Manage buckthorn • Manage cool season grasses • Plant native prairie species • Consider using controlled burn	2 (Medium)
33	2.93	FOD	80	50	0	• Habitat for Eastern Wood-pewee (SC) • Habitat for Hackberry Emperor (S3)	4e	Forest	• Manage buckthorn • Manage Dog-strangling Vine • Consider planting native trees and woodland plants in cleared areas	2 (Medium)
34	1.46	CUT	80	80	0		4e	Forest	• Manage buckthorn • Manage Dog-strangling Vine • Plant native trees and woodland plants in cleared areas	2 (Medium)
35	1.37	CUS	10	0	60		3a	Savannah	• Manage buckthorn • Manage cool season grasses and other invasives • Plant native prairie species • Consider using controlled burn	2 (Medium)
36	0.13	MAS	0	5	5		1a	Wetland	• Manage dog-strangling vine • Manage Common Reed	1 (High)
37	1.52	CUM/CUT	30	0	60	• Habitat for Monarch Butterfly (SC)	2b	Prairie / Meadow	• Manage buckthorn • Manage cool season grasses • Plant native prairie species • Consider using controlled burn	2 (Medium)

Polygon Number	Area (Ha)	Community Series (2018)	Buckthorn (% Cover 2018)	Dog-strangling Vine (% Cover 2018)	Other Invasives (% Cover 2018)	SAR / SWH / RR Species	Restoration Overlay	Target Community Series	Restoration Tasks	Restoration Priority
38	1.84	CUM/CUT	60	0	0	• Habitat for Monarch Butterfly (SC)	2c	Prairie / Meadow	• Manage buckthorn • Plant native prairie species • Consider using controlled burn	2 (Medium)
39	1.25	CUT	100	0	20		4c	Forest	• Manage buckthorn • Manage garlic mustard • Plant native trees and woodland plants in cleared areas	2 (Medium)
40	1.47	FOD	100	0	0	• Habitat for Eastern Wood-pewee (SC) • Habitat for Hackberry Emperor (S3)	4c	Forest	• Manage buckthorn • Consider planting native trees and woodland plants in cleared areas	2 (Medium)
41	0.92	MAM	0	0	25		1a	Wetland	• Manage invasive willows	1 (High)
42	3.78	CUT	100	0	0		4c	Forest	• Manage buckthorn • Plant native trees and woodland plants in cleared areas	2 (Medium)
43	3.67	FOD	50	0	0	• Habitat for Striped Cream Violet (S3) • Habitat for Eastern Wood-pewee (SC) • Habitat for Hackberry Emperor (S3)	4c	Forest	• Manage buckthorn • Consider planting native trees and woodland plants in cleared areas	2 (Medium)
44	5.85	FOD	80	0	80	• Habitat for Eastern Wood-pewee (SC) • Habitat for Hackberry Emperor (S3)	4d	Forest	• Manage buckthorn • Manage invasive willows • Manage invasive honeysuckles • Consider planting native trees and woodland species in cleared areas	2 (Medium)
45	0.83	CUM	20	0	100	• Habitat for Soft-hairy False Gromwell (S2) • Habitat for Monarch Butterfly (SC)	2b	Prairie / Meadow	• Manage buckthorn • Manage Creeping Thistle and other invasives Plant native prairie species • Consider using controlled burn	2 (Medium)
46	3.07	FOD	20	0	0	• Habitat for Eastern Wood-pewee (SC) • Habitat for Hackberry Emperor (S3)	4a	Forest	• Manage buckthorn • Consider planting native trees and woodland species in cleared areas	1 (High)
47	7.45	FOD	100	0	30	• Habitat for Eastern Wood-pewee (SC) • Habitat for Hackberry Emperor (S3)	4c	Forest	• Manage buckthorn	2 (Medium)

Polygon Number	Area (Ha)	Community Series (2018)	Buckthorn (% Cover 2018)	Dog-strangling Vine (% Cover 2018)	Other Invasives (% Cover 2018)	SAR / SWH / RR Species	Restoration Overlay	Target Community Series	Restoration Tasks	Restoration Priority
									• Manage garlic mustard, Himalayan balsam • Consider planting native trees and woodland plants in cleared areas	
48	0.61	CUM	0	5	20	• Habitat for Monarch Butterfly (SC)	2a	Prairie / Meadow	• Manage Himalayan Balsam • Manage Dog-strangling Vine Plant native prairie species • Consider using controlled burn	1 (High)
49	1.00	FOD	50	50	0	• Habitat for Eastern Wood-pewee (SC) • Habitat for Hackberry Emperor (S3)	4e	Forest	• Manage Buckthorn • Manage Dog-strangling Vine	2 (Medium)