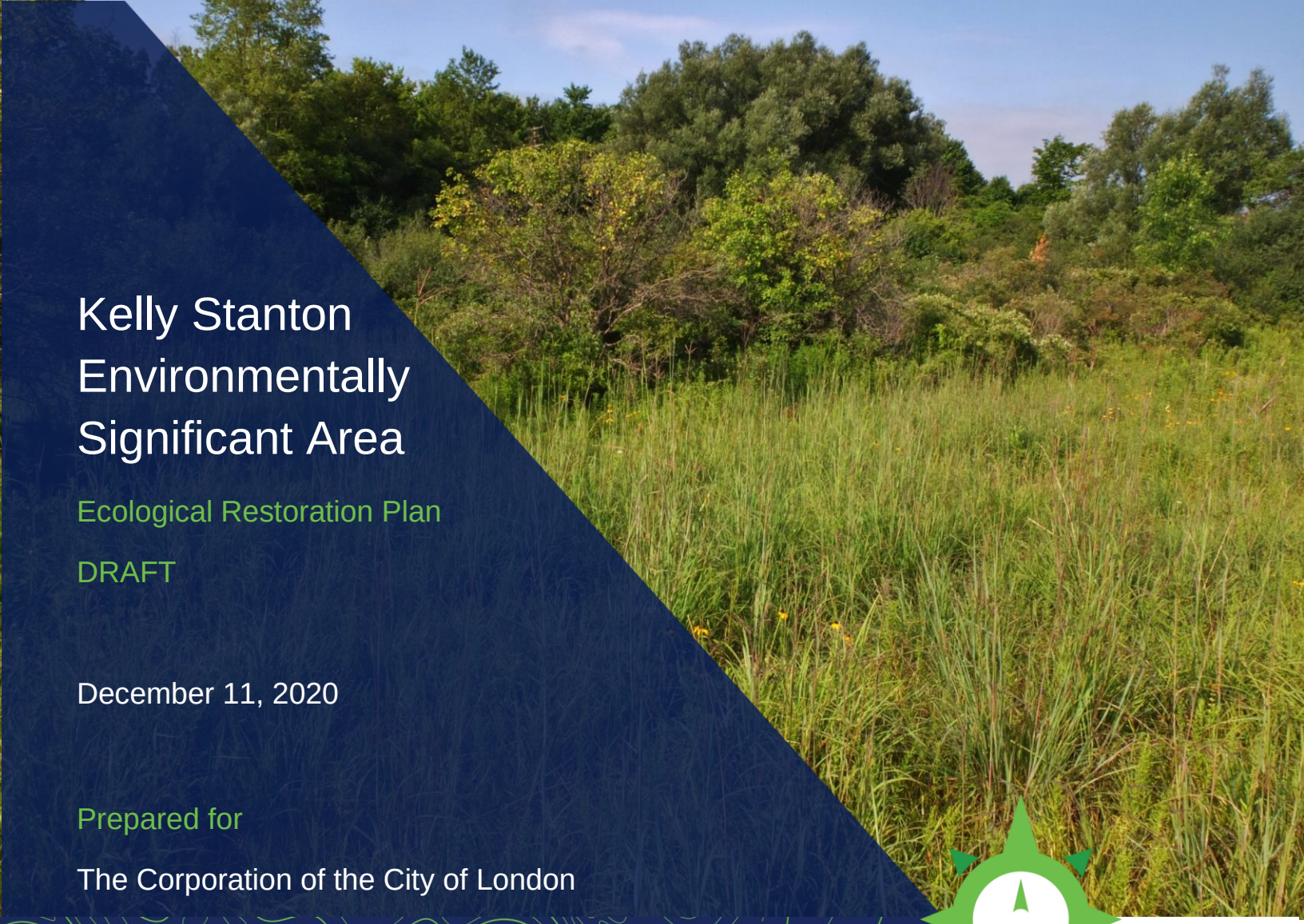

Kelly Stanton Environmentally Significant Area

Ecological Restoration Plan

DRAFT

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Prepared for

The Corporation of the City of London

north-south ENVIRONMENTAL

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Table of Contents

List of Tables

List of Figures

List of Appendices

Kelly Stanton Environmentally Significant Area Ecological Restoration Plan

1. Introduction

1.1. Background

In February of 2020, the City of London retained North-South Environmental Inc. (N.S.E.) to complete an Ecological Restoration Plan (E.R.P.) for Kelly Stanton Environmentally Significant Area (E.S.A.). Kelly Stanton E.S.A. is located in the Hyde Park area of northwest London and is divided into two blocks: the north block is located in a triangle bounded by the Canadian Pacific (C.P.) to the north, the Canadian National (C.N.) railway to the south and the London Hyde Park Rotary Trail to the east; the south block is located south of the C.N. railway and north of Staffordshire Road (**Figure 1**).

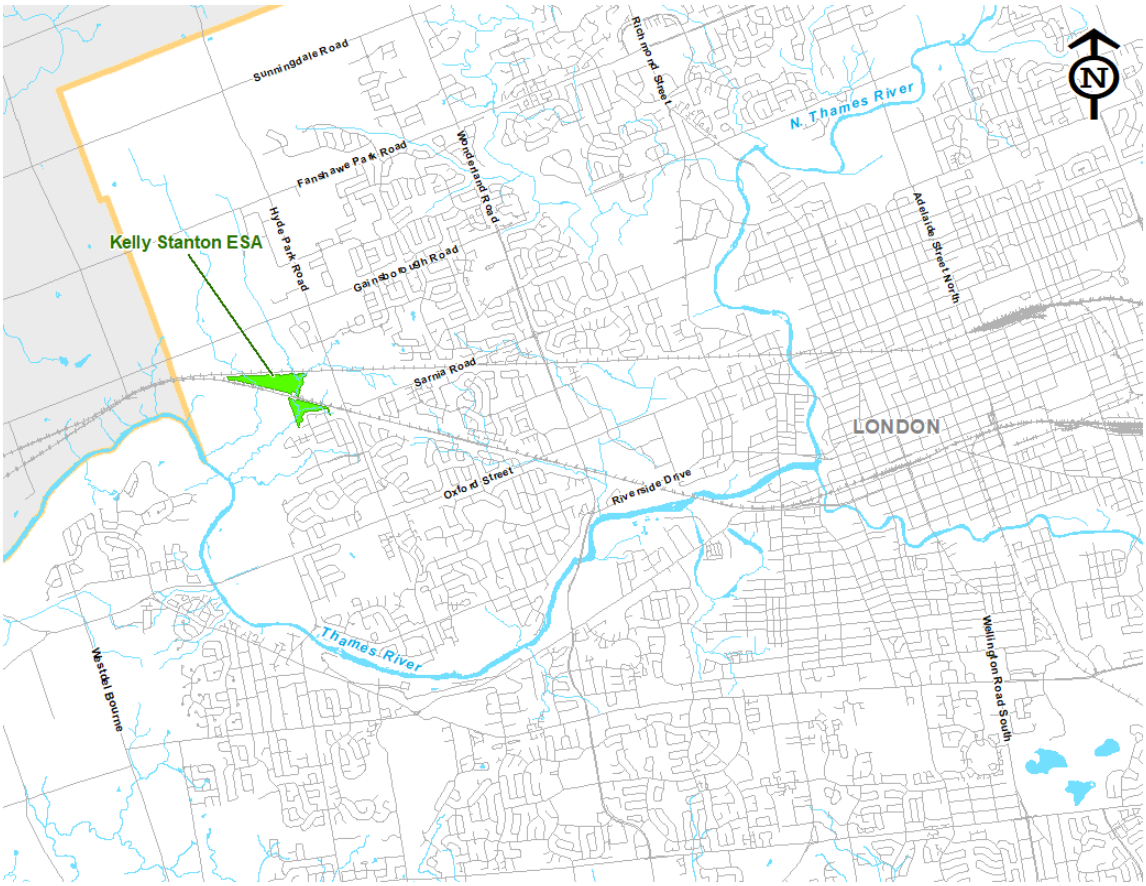

Figure 1. Location of publicly owned portions of Kelly Stanton E.S.A. in the City of London.

Kelly Stanton E.S.A. is part of a larger area of E.S.A. and potential E.S.A. lands identified on Map 5 of the London Plan (the City of London's Official Plan guiding growth over the next 20 years) east of Kains Woods E.S.A. and the Thames River Significant Valleylands. The publicly owned portions of Kelly Stanton E.S.A. currently include 18.5 hectares (ha) inside the Urban Growth Boundary. The southern portion of Kelly Stanton E.S.A. is part of a larger, regionally significant life science Area of Natural and Scientific Interest (A.N.S.I.). The Kains Road River Valley A.N.S.I. is identified on Map 5 of the London Plan and is addressed in the following London Plan policies:

> "1356: Areas of natural and scientific interest (A.N.S.I.s) represent high-quality and unique life science and earth science features across a variety of landscapes throughout the province. Life science areas of natural and scientific interest are significant representative segments of Ontario's biodiversity and natural landscapes including specific types of forests, valleys, prairies and wetlands, their native plants and animals, and their supporting environments. Earth science areas of natural and scientific interest include the best representative of bedrock, fossils and glacial landforms."
>
> "1357: There are two provincially significant life science A.N.S.I.s in London: Warbler Woods or the Byron Woods, and Komoka Provincial Park. The Komoka Provincial Park A.N.S.I. exhibits part of a Lake Maumee II bluff, which is a provincially significant earth science A.N.S.I. Kilworth Lake Maumee provincially significant earth science A.N.S.I. also represents a Lake Maumee shoreline and bluff. There are several regionally significant life science A.N.S.I.s located within environmentally significant areas. These include Sifton Bog, Westminster Ponds, and Kains Road River Valley. These areas are included within recognized environmentally significant areas as identified on Map 5."

The London Plan (the City of London's Official Plan guiding growth over the next 20 years) recognizes E.S.A.s as the largest and highest quality components of the City's Natural Heritage System (N.H.S.). Policies 1367 and 1368 of the London Plan define E.S.A.s as:

> "1367: Environmentally Significant Areas (E.S.A.s) are large areas that contain natural features and perform ecological functions that warrant their retention in a natural state. [E.S.A.s] 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 will be identified and evaluated in accordance with provincial requirements. While [E.S.A.s] 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. [E.S.A.s] are delineated through the application of the City Council approved Guideline Documents for Environmentally Significant Areas Identification, Evaluation, and Boundary Delineation and through the application of provincial guidelines."
>
> "1368: [E.S.A.s] 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 [of the London Plan]. New [E.S.A.s] 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 [E.S.A.] policies of this Plan. Areas that have the potential to meet the criteria for an [E.S.A.], but have not been thoroughly studied are identified as potential [E.S.A.s] 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. [E.S.A.s] recognized by Council are identified as [E.S.A.s] on Map 5 and included in the Green Space Place Type on Map 1."

The results of studies carried out by N.S.E. and others between 2017 and 2020 confirmed that Kelly Stanton satisfies all of the criteria for recognition as an E.S.A. under Policy 1371 of the London Plan, specifically:

1. It contains rare to uncommon natural communities within the country, province and the London subwatershed region.
2. It contains high-quality natural landform-vegetation communities that are representative of pre-settlement conditions of the dominant physiographic units within the London subwatershed region, and that have been classified as distinctive in the Province of Ontario.
3. It provides habitat for species intolerant of disturbance and for species that require extensive blocks of suitable habitat.
4. Due to its hydrologic characteristics, it contributes significantly to the healthy maintenance (quality and quantity) of a natural system beyond its boundaries.
5. It has a high biodiversity of biological communities and associated plant and animal species within the context of the London subwatershed region.
6. It serves an important wildlife habitat or linkage function.
7. It provides significant habitat for rare, threatened or endangered indigenous species of plants and animals that are rare within the country, province or county.

Some portions of the E.S.A., particularly in the south block, exhibit depressed ecosystem function as a result of a legacy of human disturbance and land use change dating back to at least the mid-nineteenth century. In the north block, cessation of hay farming since approximately 2001 has allowed tallgrass prairie vegetation to spread into former hay fields, but these areas could benefit from human intervention to accelerate succession to a more natural state. Furthermore, natural succession has resulted in shrubby vegetation encroaching into tallgrass prairie communities, which threatens the survival of rare plant and wildlife species which require open country habitat. Some vegetation communities in both the north and south blocks are dominated by invasive plant species and could benefit from careful removal and management following provincially accepted Best Management Practices (B.M.P.s).

1.2. Purpose of the Ecological Restoration Plan

The E.R.P. presents a focused, adaptive approach to maintaining and restoring the ecological integrity of Kelly Stanton E.S.A. and builds on work already completed by the E.S.A. Management Team and many community volunteers. The E.R.P. aims to maximize the efficacy of City-funded work by the E.S.A. Management Team and other ecological restoration professionals retained by the City and enhance the conservation impact of community-led restoration efforts. The City of London has been recognized as a leader among other municipalities and other levels of government for its proactive approach to managing parks, woodlands and E.S.A.s. For example, London was the first municipality in Ontario to adopt a municipal invasive plant management strategy – the London Invasive Plant Management Strategy (L.I.P.M.S) (2017) – which follows the guidance of the Ontario Invasive Plant Council's (O.I.P.C.'s) *Creating an Invasive Plant Management Strategy: A Framework for Ontario Municipalities* (Sherman, 2015). London's award-winning invasive species management work is funded by the City and is primarily implemented by the E.S.A. Management Team at the Upper Thames River Conservation Authority (U.T.R.C.A.), which includes licensed pesticide applicators, burn experts and other professionals with the expertise to implement a variety of restoration projects in London's E.S.A.s.

2. Methodology

Preparation of this E.R.P. involved a review of background materials pertaining to Kelly Stanton E.S.A., field work by professionals and many community volunteers to document existing natural heritage features, consultation with agencies and the public and development of restoration overlays to identify and prioritize areas for ecological restoration.

It is important to acknowledge that much of the field work completed for this E.R.P. was conducted by volunteer naturalists. Kelly Stanton E.S.A. has been visited in recent years by members of Nature London, the Field Botanists of Ontario and a variety of other local experts who have contributed data to this project.

2.1. Review of Background Information

Previous studies which examined all or part of Kelly Stanton E.S.A. included the Preliminary Life Science Inventory of Kains Road Forest (Stephenson, 1989), which included the south block of Kelly Stanton. Hilts and Cook (1982) mentioned the area in their description of the Kains Forest but provided few details. In 1995, what is now Kelly Stanton E.S.A. was recommended as a Candidate E.S.A. in Subwatershed Studies for Medway, Stanton and Mud Creeks (City of London, 1995).

A variety of sources were consulted to identify species and natural heritage features in Kelly Stanton E.S.A., including:

- Preliminary Life Science Inventory of Kains Road Forest (Stephenson, 1989)
- City of London Subwatershed Studies Life Science Inventories (Bowles et al., 1994)
- Group 1 Subwatershed Studies for Medway, Stanton and Mud Creeks (City of London, 1995)
- 2017 Watershed Report Card for Riverbend (U.T.R.C.A., 2017)
- Species lists and habitat descriptions from the Environmental Impact Study (E.I.S.) for 1176, 1200 and 1230 Hyde Park Road (Stantec, 2018)
- Historical imagery of the E.S.A. dating back to 1954
- Geospatial data from the City of London, U.T.R.C.A. and Land Information Ontario (LIO)
- The Natural Heritage Information Centre's (N.H.I.C.'s) Natural Heritage Areas mapping application
- Citizen science applications, namely iNaturalist and eBird

iNaturalist and eBird, in particular, were vital data collection tools for this inventory. A collection project for Kelly Stanton E.S.A. was created on iNaturalist in February of 2020, which has collected records of over 200 species in the E.S.A. as of August, 2020. Kelly Stanton is also a birdwatching hotspot on eBird and over 40 checklists containing a total of bird 93 species have been submitted for the E.S.A. as of August, 2020. Both iNaturalist and eBird provided high quality data vetted by local and global taxonomic experts.

2.2. Field Investigations

Formal field investigations were completed in both the north and south blocks of Kelly Stanton E.S.A. between 2017 and 2020 by N.S.E. ecologists Will Van Hemessen and Pauline Catling, along with other local naturalists. Formal studies consisted of:

- High-level classification of vegetation communities using the Ecological Land Classification (E.L.C.) system for southern Ontario (Lee et al., 1998).
- A three-season (spring, summer and fall) inventory of plant species
- Mapping the locations and densities of invasive alien species
- Breeding bird surveys (O.B.B.A. protocol)
- Documentation of other wildlife observed incidentally within the E.S.A.
- Review of significant wildlife habitat (S.W.H.) in the E.S.A. using the S.W.H. Criteria Schedules for Ecoregion 7E (M.N.R.F., 2015)

For the purposes of vegetation community classification and invasive species mapping, vegetation community polygons were delineated on desktop using geographic information systems (G.I.S.) software. Polygons were then visited in the field and were refined, merged or split depending on field conditions. Vegetation community polygons were numbered and were used to develop the restoration overlays described in **Section 4.1**.

Table 1 lists the dates of formal field work tasks completed for this E.R.P. between 2017 and 2020. In addition to these field visits, dozens of additional visits have been made to Kelly Stanton where formal surveys were not conducted, but observations were made of migratory birds, reptiles and amphibians and many other organisms. The results of field investigations were combined with background data to develop the biophysical inventory presented in **Section 3**.

Table 1. Dates of field investigations and tasks completed

Date	Surveyor(s)	Task(s)
June 23, 2017	Will Van Hemessen	Summer vegetation survey
July 27, 2017	Will Van Hemessen	Summer vegetation survey
August 18, 2017	Will Van Hemessen	Summer vegetation survey
October 27, 2017	Will Van Hemessen	Fall vegetation survey
April 27, 2018	Will Van Hemessen	Spring vegetation survey
June 3, 2018	Will Van Hemessen	Spring vegetation survey, E.L.C., breeding bird surveys
August 30, 2018	Will Van Hemessen	Summer vegetation inventory, E.L.C.

Date	Surveyor(s)	Task(s)
May 29, 2020	Will Van Hemessen, Pauline Catling, Quinten Wiegersma	Spring vegetation survey
August 5, 2020	Will Van Hemessen, Pauline Catling	E.L.C., invasive species mapping
August 6, 2020	Will Van Hemessen, Pauline Catling	E.L.C., invasive species mapping

2.3. Community Engagement

The community were engaged in site visits and contributed significantly to the collection of ecological data as described in **Section 2**. Volunteers with the Neighbours of Hunt Club Adopt an E.S.A. group have enhanced local stewardship in the north section of Kelly Stanton E.S.A. since they formally adopted it in mid-2020 as described in **Section 4.2.3**. Opportunities for the community to assist with implementation of the E.R.P. are identified in **Section 4**. The findings and recommendations of the E.R.P. will be presented to the community in a webinar with opportunities for feedback.

2.4. Preparing the Ecological Restoration Plan

2.4.1. Developing Restoration Overlays

In a broad sense, *ecological restoration* refers to improving the integrity and function of an ecosystem through active management. Parks Canada (2008) defines ecological restoration as “the process of assisting the recovery of an ecosystem that has been degraded, damaged or destroyed”. For the purposes of this E.R.P., ‘restoration overlays’ refer to polygons within Kelly Stanton E.S.A. which have specific management objectives which will contribute to overall ecological restoration within the E.S.A. Restoration overlays for Kelly Stanton E.S.A. include management objectives which could be achieved, under the direction of the City of London, by the E.S.A. Management Team, community volunteers or other restoration professionals.

Key management objectives for Kelly Stanton are invasive species management and maintenance of the remnant tallgrass prairie vegetation in the E.S.A. Restoration overlays are defined by combinations of the following management objectives:

- Tallgrass prairie maintenance
- Tallgrass prairie restoration
- Invasive species management

The restoration overlays developed using these management objectives are discussed

in detail in **Section 4.1** and are illustrated on **Map 4 in Appendix 1**. Specific restoration activities may include (but are not necessarily limited to):

- Removal of woody vegetation encroaching on tallgrass prairie vegetation
- Controlled burns
- Seeding or planting of tallgrass prairie species in former hay fields
- Invasive species management

Like all E.S.A.s, invasive species management in Kelly Stanton will follow B.M.P.s developed by O.I.P.C. and will be consistent with the L.I.P.M.S (City of London, 2017). It should be noted that some invasive species management activities have already been conducted in Kelly Stanton E.S.A. by the City-funded E.S.A. Management Team.

2.4.2. Determining Restoration Priorities and Timelines

The management objectives for Kelly Stanton E.S.A. described above were prioritized with the following principles in mind:

- Restoration and enhancement of habitat for S.A.R. and species of conservation concern is a priority
- Existing tallgrass prairie communities and S.W.H. are provincially significant and significant in the City of London, and maintenance of these features will be a priority
- Maintaining and/or increasing native species richness of plants and wildlife is a primary restoration objective
- Areas with low densities of invasive species should be prioritized for restoration since they have the greatest potential for 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 restore

Restoration priorities were assigned to each vegetation community polygon in Kelly Stanton E.S.A. using a scoring system based on the attributes listed in **Table 2**. Polygons with higher scores were assigned 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 2. Attributes and scoring system for determining restoration priority

Date	Score
Habitat for S.A.R., species of conservation concern or regionally rare species	1 per species
S.W.H. or rare vegetation community	1 per type
>50% native species cover	1
<5 % invasive species cover	2
5-25% invasive species cover	1
>25% invasive species cover	0

3. Biophysical Inventory

3.1. Physiographic Setting

The majority of Kelly Stanton E.S.A. is located on tablelands above the Thames River. The E.S.A. is located in the Strathroy-Caradoc Sand Plain physiographic region, which is characterized by deep, well-drained sandy and gravelly substrates deposited by glacial meltwaters at the end of the most recent ice age (Chapman and Putnam, 1984). Soils in the E.S.A. consist mainly of well-drained coarse sandy loam with finer substrates in low-lying areas along the two creeks (Kelly Creek in the west and Stanton Creek in the east). The E.S.A.'s north block slopes gently from its highest point at the western end of the E.S.A. to its lowest point at the eastern end. The south block contains more rugged topography owing to the steep valley occupied by Stanton Creek. Topography in both the north and south blocks is defined by Kelly Creek, Stanton Creek and their tributaries.

3.2. Land Use History

Prior to European settlement, vegetation in the Hyde Park area was probably a mosaic of tallgrass prairie, savannah and oak woodland with deciduous forest communities in the Thames River valley and the smaller valleys of Kelly Creek, Stanton Creek and other watercourses. Based on reconstructions of historical vegetation in Middlesex County from a variety of sources, Findlay (1973) identified an area of "open plains" to the north of the village of Hyde Park (**Figure 2**) and mapped the area around Hyde Park and south to the Thames River as a mixture of "oak plains" and maple-ash forest (W. Bakowski, pers. comm., August, 2020). With this historical context in mind, the existing vegetation in Kelly Stanton E.S.A. (e.g., remnant tallgrass prairie vegetation on tablelands and hickory-maple-ash forest on valley slopes) seems to be an excellent, albeit degraded, reflection of pre-European vegetation.

An 1878 map of the Hyde Park area indicates that the lots currently occupied by Kelly Stanton E.S.A. were owned by George Dickey (who owned most of what is now the

north block of Kelly Stanton), Thomas Lewis and John Barclay, but nothing else is known about these early landowners. The first railway through Hyde Park was constructed in the 1850s and the modern C.N. tracks occupy the same right of way (C.N. Rail Company, 2020). The C.P. railway was constructed in the 1880s along with a north-south spur line from the C.N. railway which connected the village of Hyde Park to Lucan in the north.[1] The triangle of land between these three railways corresponds roughly to the current boundaries of the north block of Kelly Stanton E.S.A. It remained relatively untouched through the first half of the twentieth century, perhaps because its small size and relative inaccessibility made it unprofitable for agriculture. Aerial imagery from 1954 suggests that this triangle of land consisted primarily of remnant prairie vegetation well into the twentieth century. Hay farming began in two small areas in the north block of what is now Kelly Stanton at some point between 1954 and the 1990s but ceased in approximately 2001. Because agricultural activity in the E.S.A.'s north block lasted only a few decades and consisted of hay farming rather than row crops, much of the original seed bank remained intact, which is evidenced by the native open country plant species which currently grow in the former hay fields.

Figure 2. Reconstruction of vegetation composition in the Hyde Park area at the time of European settlement (Findlay, 1973). Solid yellow indicates "open plains" and hatched yellow indicates "oak plains".

[1] The right-of-way of this spur line is now occupied by the London Hyde Park Rotary Link trail.

The E.S.A.'s south block has experienced considerably more disturbance than the north block and has suffered from infestations of Common Buckthorn (*Rhamnus cathartica*), which dominates most of the subcanopy and understory, and Emerald Ash Borer (*Agrilus planipennis*), which has killed most of the ash trees in its forest communities.

3.1. Utilities

With the exception of the C.N. railway, which divides the E.S.A.'s north and south blocks, there is no existing utility infrastructure within Kelly Stanton E.S.A. and no utility rights-of-way.

3.2. Hydrological Features and Aquatic Habitat

3.2.1. Surface Water Features

Kelly Creek

Kelly Creek flows in a generally northwest-to-southeast direction through the western half of Kelly Stanton E.S.A.'s north block. It enters the E.S.A. after flowing through a culvert beneath the C.P. railway and it flows through a second culvert beneath the C.N. railway after exiting the E.S.A. Kelly Creek was described as having a moderately tolerant warmwater fish community in the 1995 subwatershed study, but recent fish community data could not be obtained for this E.R.P. Within the E.S.A., it is a slower-moving watercourse than Stanton Creek and contains a mix of sandy and gravelly substrates and a large amount of woody debris which may present barriers to fish passage.

Stanton Creek

Stanton Creek flows in a generally north-to-south direction through both the north and south blocks of Kelly Stanton E.S.A. It enters the north block of the E.S.A. after flowing through a culvert beneath the C.N. railway. The creek then flows through a culvert underneath the C.N. right-of-way before entering the south block. In the north block, Stanton Creek occupies a relatively shallow valley and is relatively fast moving with a mix of gravelly and cobbly substrates. Roughly halfway along its course through the north block, Stanton Creek flows beneath a former laneway through two severely degraded corrugated steel pipe (CSP) culverts. In the south block, Stanton Creek has cut a much deeper valley as it descends towards its confluence with the Thames River. Stanton Creek was described as having a moderately tolerant warmwater fish community in the 1995 subwatershed study. Recent fish community data could not be obtained for this E.R.P.

Other Drainage Features

The only other permanent watercourse in Kelly Stanton E.S.A. is an unnamed tributary of Stanton Creek which originates from a stormwater management facility to the northeast of the E.S.A.'s north block. Two intermittent tributaries of Kelly Creek originate in the north block of the E.S.A. and enter Kelly Creek within the C.N. right-of-way immediately south of the E.S.A. boundary.

3.2.2. Groundwater Features

Almost all of Kelly Stanton E.S.A. is within a significant groundwater recharge area (Thames-Sydenham and Region Source Protection Committee, 2020). The only noteworthy groundwater seepage areas are in the north block at the sources of two intermittent tributaries to Kelly Creek. Groundwater seepage is probably not the primary source of these tributaries since they are wet only during spring freshet and after major storm events.

3.3. Vegetation

3.3.1. Vegetation Communities

A total of 24 vegetation community polygons were delineated in Kelly Stanton E.S.A. consisting of ten different vegetation community types (see **Table 3**). Communities were difficult to delineate in some instances where "complexes" of various vegetation types have developed (e.g., tallgrass prairie succeeding into cultural thicket or deciduous forest transitioning to cultural woodland where ash trees have died off). Some polygons were therefore assessed as complexes of more than one community type. Some vegetation communities in Kelly Stanton are of cultural origin (e.g., old hay fields) but most communities are of natural origin. Remnant tallgrass prairie vegetation is dominant in some areas (e.g., Polygon #s 10 and 20) and persists in others despite encroachment of other types of vegetation in the absence of disturbance (e.g., Polygon #s 3 and 8).

Open country communities in Kelly Stanton include cultural meadows, which are dominated by non-native species (e.g., cool season grasses and forage crops) and tallgrass prairies. Tallgrass prairies in Kelly Stanton are of the fresh-moist type (TPO2-1) and are dominated by warm-season grasses such as Big Bluestem (*Andropogon gerardii*) and Indian Grass (*Sorghastrum nutans*). One indicator species of provincially significant prairie remnants is found in Kelly Stanton: Mead's Sedge (*Carex meadii*) (MNR, 2000). Forests in Kelly Stanton occur primarily in the Stanton Creek valley and are dominated by Bitternut Hickory (*Carya cordiformis*) and Sugar Maple (*Acer saccharum*). These forests have been heavily invaded by Common Buckthorn

(*Rhamnus cathartica*), especially in areas where ash trees have died off and opened up the canopy. Moist lowland forest dominated by White Willow (*Salix alba*) occurs in the floodplain of Kelly Creek. Wetland communities include meadow marshes, which are primarily dominated by Reed Canary Grass (*Phalaris arundinacea*) in the Stanton Creek floodplain and by forbs in the Kelly Creek floodplain, and a thicket swamp containing Grey Dogwood (*Cornus racemosa*) and willows (*Salix* spp.).

Table 3. Vegetation communities in Kelly Stanton E.S.A.

E.L.C. Code	Community Type	Area (ha)	Description
CUM1	Mineral Cultural Meadow (Polygon #s 1, 8, 17, 24)	4.00	Cultural meadows in Kelly Stanton E.S.A. occur in old hayfields and in other open areas which have experienced either human disturbance or have succeeded from tallgrass prairie into forb-dominated meadow communities. The largest cultural meadows occur in former hay fields in the north block. These meadows are dominated by non-native cool-season grasses but also contain native open country species such as Big Bluestem, Little Bluestem (*Schizachyrium scoparium*), evening-primroses (*Oenothera* spp.), Common Milkweed (*Asclepias syriaca*) and Showy Tick-trefoil (*Desmodium canadense*).
CUT1	Mineral Cultural Thicket (Polygon #s 2, 4, 6, 11, 13, 18, 19)	2.04	Cultural thickets in Kelly Stanton E.S.A. are mainly dominated by invasive Common Buckthorn (*Rhamnus cathartica*) and Glossy Buckthorn (*Frangula alnus*) but some thickets are dominated by native Grey Dogwood and Staghorn Sumac (*Rhus typhina*).
CUW1	Mineral Cultural Woodland (Polygon #23)	3.13	The eastern half of the south block of Kelly Stanton E.S.A. (Polygon #23) was historically dominated by White Ash (*Fraxinus americana*) but the majority of ash trees have

E.L.C. Code	Community Type	Area (ha)	Description
			died due to infestation by Emerald Ash Borer (*Agrilus planipennis*), which has left substantial gaps in the canopy. The relatively open canopy and buckthorn-dominated understory mean that this community now qualifies as a woodland rather than forest.
FOD6-5	Fresh-Moist Sugar Maple-Hardwood Deciduous Forest (Polygon #21)	1.85	Most of the Stanton Creek valley in the south block of Kelly Stanton E.S.A. is covered with Sugar Maple-dominated deciduous forest which also contains a diversity of other deciduous species such as Bitternut Hickory, American Beech (*Fagus grandifolia*) and Northern Hackberry (*Celtis occidentalis*). White Ash was historically abundant, but most ash trees have died due to infestation by Emerald Ash Borer.
FOD7-3	Fresh-Moist Willow Lowland Deciduous Forest (Polygon #7)	0.13	Portions of the Kelly Creek floodplain which are dominated by mature White Willows are classified as this community type.
FOD8-1	Fresh-Moist Poplar Deciduous Forest (Polygon #12)	0.48	Polygon #12 is a relatively young forest of Trembling Aspen (*Populus tremuloides*). Trembling Aspen is a pioneer species and it is probable that this forest occupies an area that was historically tallgrass prairie but transitioned to deciduous forest in the absence of disturbance.
FOD9-5	Fresh-Moist Bitternut Hickory Deciduous Forest (Polygon #14)	3.71	The largest forest in the north block of Kelly Stanton E.S.A. (Polygon #14) is dominated by Bitternut Hickory with abundant Sugar Maple and other hardwoods. White Ash was historically abundant but most ash trees here and throughout the E.S.A. have

E.L.C. Code	Community Type	Area (ha)	Description
			died due to infestation by Emerald Ash Borer. Buckthorns dominate the subcanopy and understory of this community, especially where ash die off has resulted in canopy openings.
MAM2-2	Reed Canary Grass Mineral Meadow Marsh (Polygon #s 15, 22)	0.84	Meadow marshes in the Stanton Creek floodplain in both the north and south blocks of the E.S.A. are dominated almost entirely by Reed Canary Grass.
MAM2-10	Forb Mineral Meadow Marsh (Polygon #5)	0.35	Most of the Kelly Creek floodplain is covered by forb-dominated meadow marsh. Common species in this community include spotted Joe Pye-weed (*Eutrochium maculatum*), Spotted Jewelweed (*Impatiens capensis*), Lake Sedge (*Carex lacustris*) and Swamp Aster (*Symphyotrichum puniceum*).
SWT2	Mineral Thicket Swamp (Polygon #9)	0.47	Polygon #9 is a thicket swamp with relatively equal abundance of Grey Dogwood, willows and Glossy Buckthorn.
TPO2-1	Fresh-Moist Tallgrass Prairie (Polygon #s 10, 20)	0.41	Tallgrass prairie communities have persisted in the north block of Kelly Stanton E.S.A. since before European settlement. These communities are primarily the fresh-moist type and are dominated by Big Bluestem and Indian Grass. Abundant species include Smooth Aster (*Symphyotrichum laeve*), Early Goldenrod (*Solidago juncea*), Grey Goldenrod (*Solidago nemoralis*) and Showy Tick-trefoil. Tallgrass prairie communities contain provincially and regionally rare species such as Mead's Sedge and False Tomentose Balsam

E.L.C. Code	Community Type	Area (ha)	Description
			Ragwort (*Packera paupercula* var. *pseudotomentosa*).
TPO2-1/CUT1	Fresh-Moist Tallgrass Prairie/ Mineral Cultural Thicket Complex (Polygon #3)	0.75	Tallgrass prairies require periodic disturbance (primarily fire) in order to persist and avoid succession into other types of vegetation communities such as meadows and thickets. In the absence of fire and other types of disturbance, tallgrass prairie vegetation in Kelly Stanton E.S.A. is being overtaken by shrubs (primarily Grey Dogwood and Staghorn Sumac), creating complexes of tallgrass prairie and cultural thicket.

3.3.2. Rare Plants

A total of 256 plant species have been identified in Kelly Stanton E.S.A. (see **Appendix 2**). This includes two provincially rare species and 15 regionally rare plant species (see **Table 4**). Regional rarity (i.e., conservation status in Middlesex County) was determined using the List of the Vascular Plants of Ontario's Carolinian Zone (Ecoregion 7E) (Oldham, 2017). Provincially and regionally rare species in Kelly Stanton are primarily associated with tallgrass prairie (e.g., Mead's Sedge, False Tomentose Balsam Ragwort) but some are associated with forests (e.g., One-flowered Cancer-root) or wetlands (e.g., Small-headed Bulrush). The importance of these vegetation communities for providing habitat for rare plant species is reflected in the restoration overlays in **Section 4**.

Table 4. Rare plant species in Kelly Stanton E.S.A.

Species	Status[1]	Polygon(s)	Discussion
Provincially Rare			
Mead's Sedge *Carex meadii*	N.H.I.C. – S2 MIDD – R	3	A large colony of Mead's Sedge was found growing beneath Grey Dogwood in Polygon #3. In Ontario, Mead's Sedge only grows in open prairies (MNR, 2000), so the presence of this species indicates that this community was once open prairie which is experiencing

Species	Status[1]	Polygon(s)	Discussion
			succession to a thicket type community.
False Tomentose Balsam Ragwort *Packera paupercula var. pseudotomentosa*	N.H.I.C. – S2S3 MIDD – R	10	A small population of False Tomentose Balsam Ragwort was found in moist tallgrass prairie in Polygon #10.
Regionally Rare			
Bristly Blackberry *Rubus setosus*	N.H.I.C. – S4 MIDD – R	8	The population of Bristly Blackberry found in Kelly Stanton E.S.A. is the first record of this species for Middlesex County. This species grows in "open woodlands, savannahs, prairies, meadows and disturbed areas" (Flora of North America (FNA), 2020).
Butterfly Milkweed *Asclepias tuberosa*	N.H.I.C. – S4 MIDD – R	3	Butterfly Milkweed is found in scattered locations in Polygon #3.
Cockspur Hawthorn *Crataegus crus-galli*	N.H.I.C. – S4 MIDD – R	3, 6	Cockspur Hawthorn is found in scattered locations at the western end of the E.S.A.
Greater Straw Sedge *Carex normalis*	N.H.I.C. – S4 MIDD – R	8	Greater Straw Sedge is found in wet areas of Polygon #8.
Jointed Rush *Juncus articulatus*	N.H.I.C. – S5 MIDD – R	17	Jointed Rush was found in a wet seepage area in Polygon #17. This species is common farther north but is rare in Middlesex County.
Muhlenberg's Sedge *Carex muehlenbergii*	N.H.I.C. – S4S5 MIDD – R	8	Muhlenberg's Sedge was found at several locations in dry, sandy soil in Polygon #8. This species grows in "dry grasslands and open forests, commonly on sand" (FNA, 2020).
Narrow-leaved Blue-eyed-grass *Sisyrinchium angustifolium*	N.H.I.C. – S4	17	Narrow-leaved Blue-eyed-grass was found in disturbed, gravelly soil in Polygon #17.

Species	Status[1]	Polygon(s)	Discussion
	MIDD – R		
One-flowered Cancer-root *Aphyllon uniflorum*	N.H.I.C. – S4 MIDD – R	14	One-flowered Cancer-root was found growing at the edge of an old laneway in Polygon #14.
Pale Sedge *Carex pallescens*	N.H.I.C. – S4 MIDD – R	3	Pale Sedge was found in Polygon #3 a short distance down the slope from the large population of Mead's Sedge.
Parasol Sedge *Carex umbellata*	N.H.I.C. – S5 MIDD – R	13, 14	Parasol Sedge is found in Polygon #13 and openings in Polygon #14.
Prairie Smoke *Geum triflorum*	N.H.I.C. – S4 MIDD – R	1	A single stem of Prairie Smoke was found in Polygon #1. It is unclear whether this plant could have been introduced here or whether it may be the last remnant of a natural population.
Small-headed Bulrush *Scirpus microcarpus*	N.H.I.C. – S5 MIDD – R	15	Small-headed Bulrush grows along Stanton Creek in Polygon #15.
Swan's Sedge *Carex swanii*	N.H.I.C. – S4 MIDD – R	2	Swan's Sedge was found in a dense dogwood thicket in Polygon #2. This species is found in "dry to wet mesic forests and scrub" (FNA, 2020) so its habitat in Kelly Stanton is typical of this species.

[1]Provincial conservation status (N.H.I.C., 2020): S2 – Imperiled, S2S3 – Imperiled or Vulnerable; Regional conservation status in Middlesex County (Oldham, 2017): R – Rare.

3.3.3. Invasive Plants

Kelly Stanton E.S.A. contains relatively few invasive species for an urban natural area. Invasive species are most abundant in the south block, especially in areas the ash trees have died off and then been invaded by Common Buckthorn. Invasive species which stand out as the most significant and dominant invasive species in the E.S.A. include:

- **Common Buckthorn and Glossy Buckthorn:** Common Buckthorn and Glossy

Buckthorn were introduced to North America from Europe in the 1800s because their rapid growth rates made them ideal species for hedgerows and windbreaks (Anderson, 2012a). They are now widespread across North America and are considered invasive in nearly every jurisdiction in Canada and the United States. Common Buckthorn is more common in upland habitats and Glossy Buckthorn is more common in lowland or wetland habitats. However, both species are relatively facultative and can occur in both uplands and lowlands. Among other ecological impacts, buckthorns have recently been shown to affect amphibian breeding success because they release the metabolite emodin from their roots into wetlands, which disrupts amphibian embryonic development (Sacerdote & King, 2014). In Kelly Stanton E.S.A., buckthorns are a dominant understory species in most forest communities and several thicket communities, including Polygon #s 4, 14, 16, 19, 21 and 23. In Polygon #s 16, 19 and 23, buckthorns make up close to 100% of the subcanopy, understory and groundcover.

- **Cool Season Grasses:** cool season grasses refer to exotic grass species that are adapted to cool climates, many of which were introduced to North America as pasture grasses. Examples in Kelly Stanton include Creeping Bentgrass (*Agrostis stolonifera*), Smooth Brome (*Bromus inermis*) and Kentucky Bluegrass (*Poa pratensis*). Additionally, Red Fescue (*Festuca rubra*), while native to far northern Ontario, is widely believed to have been introduced to southern Ontario and may be considered invasive where it forms dense monocultures, such as in Polygon #8 in Kelly Stanton E.S.A. Cool season grasses are a threat to tallgrass prairie communities since they can outcompete native warm-season prairie grasses such as Big Bluestem and Indian Grass. Cool season grasses (and other non-native pasture plants) are dominant in Polygon #8 and present in other polygons in Kelly Stanton.
- **Dog-strangling Vine (*Vincetoxicum rossicum*):** Dog-strangling Vine was introduced to North America from eastern Europe in the late 1800s, probably as an ornamental plant. Its seeds are windborne, which means this species can disperse large distances from established populations. In addition to displacing native plant species, Dog-strangling Vine poses a risk to the Monarch butterfly: adult Monarchs mistake Dog-strangling Vine for milkweed (*Asclepias* spp.) plants, but the plant cannot be digested by Monarch larvae. Only one stem of Dog-strangling Vine has been found in Kelly Stanton E.S.A., which was immediately removed. However, it is abundant along the C.N. and C.P. railways and it could easily be reintroduced into the E.S.A. and become extremely invasive.

Other invasive species in Kelly Stanton E.S.A. are present at low densities and can

probably be easily managed. **Table 5** lists other invasive species identified in the E.S.A. With funding from the City of London, the E.S.A. Management Team has conducted some invasive species management activities in Kelly Stanton, including herbicide control of invasive Common Reed (*Phragmites australis* ssp. *australis*) in the E.S.A.'s south block. Invasive species distributions are constantly shifting, and it is very likely that new invasive species will be introduced to Kelly Stanton over time. An early detection, rapid response (E.D.R.R.) approach should be implemented in order to monitor and manage invasive species in the E.S.A. The E.D.R.R. approach is discussed in more detail in **Section 4.3.1**.

Table 5. Invasive plant species in Kelly Stanton E.S.A.

Species	Description	Opportunities for Volunteer-based Management
Autumn Olive *Elaeagnus umbellata*	Autumn Olive occurs in scattered locations in Polygon #s 3, 8, 17 and 18. Management of Autumn Olive should follow provincial B.M.P.s (Warne, 2018a).	Yes
Bird's-foot Trefoil *Lotus corniculatus*	Bird's-foot Trefoil occurs occasionally in Polygon #8. This long-lived perennial was originally introduced to North America as a pasture plant and continues to be used for erosion control (Mersereau & DiTommaso, 2003).	Yes
Common Buckthorn *Rhamnus cathartica*	A dominant invasive species in forest and thicket communities in Kelly Stanton E.S.A. (see above). Management of Common Buckthorn should follow provincial B.M.P.s (Anderson, 2012a).	Yes
Common Reed *Phragmites australis ssp. australis*	*Phragmites* is remarkably absent from Kelly Stanton despite there being abundant suitable habitat. One patch of *Phragmites* was sprayed by the E.S.A. Management Team in 2018. Because *Phragmites* rapidly colonizes new habitats, it is important that monitoring using an E.D.R.R. approach pay particular attention to this species. Management of *Phragmites* should	Yes

Species	Description	Opportunities for Volunteer-based Management
	follow provincial B.M.P.s (M.N.R.F., 2011).	
Cool season grasses Poaceae spp.	Dominant in Polygon #8 and abundant in other meadow communities (see above).	Yes
Creeping Thistle *Cirsium arvense*	Creeping Thistle occurs at low densities in meadow communities in Kelly Stanton E.S.A.	Yes
Dog-strangling Vine *Vincetoxicum rossicum*	Dog-strangling Vine is abundant along the C.N. and C.P. railways adjacent to Kelly Stanton E.S.A. and could easily be introduced to the E.S.A. Monitoring using an E.D.R.R. approach should pay particular attention to this species. Management should follow provincial B.M.P.s (Anderson, 2012b).	Yes
Eastern Hedge Bedstraw *Galium album*	Eastern Hedge Bedstraw is abundant in Polygon #8. This long-lived perennial can take hold in meadow and prairie communities where it easily outcompetes native plants (Mersereau & DiTommaso, 2003).	Yes
Garlic Mustard *Alliaria petiolata*	Garlic Mustard is abundant in forest and woodland communities in Kelly Stanton (i.e., Polygon #s 7, 12, 14, 21 and 23). 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 B.M.P.s (Anderson, 2012c).	Yes
Glossy Buckthorn *Frangula alnus*	Abundant in forest and thicket communities throughout Kelly Stanton, though less abundant than	Yes

Species	Description	Opportunities for Volunteer-based Management
	Common Buckthorn. Management of Glossy Buckthorn should follow provincial B.M.P.s (Anderson, 2012a).	
Honeysuckles *Lonicera* spp.	Invasive honeysuckles are present at low densities in most forest and thicket communities in Kelly Stanton. Management of invasive honeysuckles should follow provincial B.M.P.s (Tassie & Sherman, 2014a).	Yes
Knapweeds *Centaurea* spp.	Knapweed is abundant in meadow communities in Kelly Stanton, especially Polygon #8. 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 & Powell, 2017). Management of Spotted Knapweed and other knapweeds should follow provincial B.M.P.s (Sherman & Powell, 2017).	Yes
Purple Loosestrife *Lythrum salicaria*	Purple Loosestrife is present at low densities in moist habitats throughout Kelly Stanton, especially in moist parts of Polygon #8. Management of Purple Loosestrife should follow provincial B.M.P.s (Warne, 2016a).	Yes
Willows *Salix* spp.	Invasive White Willow is dominant in parts of the Kelly Creek floodplain. Purple Willow (*S. purpurea*) is abundant in Polygon #24.	Yes

3.4. Wildlife

3.4.1. Birds

Breeding Birds

Formal breeding bird surveys were carried out in June of 2018. Additionally, numerous bird checklists for the E.S.A. have been submitted by local naturalists to eBird, which serves as an excellent source of supplementary data. A full list of bird species documented in Kelly Stanton E.S.A. during the breeding season can be found in **Appendix 2**.

A total of 84 bird species have been documented during the breeding season at Kelly Stanton E.S.A. Of these, six species were confirmed to be breeding in the E.S.A. and 61 species were determined to be probable or possible breeders. Kelly Stanton E.S.A. provides breeding habitat for bird species with a variety of life histories and habitat requirements, including grassland birds, forest birds, marsh birds and birds of thickets and early successional habitats.

At least four bird S.A.R. and four bird species of conservation concern use Kelly Stanton E.S.A. as habitat for breeding and other life processes. In addition, 43 bird species documented in the E.S.A. are considered to be of Conservation Priority in Middlesex County by Bird Studies Canada (Couturier, 1999).

Migratory Birds

A total of 25 bird species have been documented in Kelly Stanton E.S.A. which are not believed to breed in the E.S.A. but use habitat there for winter foraging or as a stopover location during migration. The E.S.A. provides important overwintering habitat for these species and as a place to feed or rest during migration to their breeding grounds.

3.4.2. Reptiles and Amphibians

Three species of snakes – DeKay's Brownsnake (*Storeria dekayi*), Eastern Gartersnake (*Thamnophis sirtalis sirtalis*) and Eastern Milksnake (*Lampropeltis triangulum*) – were observed in Kelly Stanton E.S.A. One species of turtle – Midland Painted Turtle (*Chrysemys picta marginata*) – was seen in the E.S.A.'s north block by a local naturalist and submitted to iNaturalist. This is the only turtle observation in the E.S.A.

Formal amphibian breeding surveys were not conducted for this study, but several nighttime visits were conducted during which four amphibian species were heard calling: American Toad (*Anaxyrus americanus*), Spring Peeper (*Pseudacris crucifer*), Western Chorus Frog (*Pseudacris triseriata*) and Northern Leopard Frog (*Lithobates*

pipiens). These species breed in vernal pools in Polygon #14. The number of breeding individuals of these species is probably sufficient for this polygon to qualify as significant amphibian breeding habitat (woodland type) based on M.N.R.F. (2015) criteria (i.e., more than 20 individuals of all species combined).

3.4.3. Other Wildlife

Other wildlife species observed in Kelly Stanton E.S.A. include mammals, insects and crayfish. Many of these were not documented during formal surveys but have been observed by local naturalists and submitted to iNaturalist. White-tailed Deer (*Odocoileus virginianus*) are common in the E.S.A. along with other mammals such as Northern Raccoon (*Procyon lotor*) and Eastern Cottontail (*Sylvilagus floridanus*).

Monarch butterflies, which are listed as a Special Concern species under the *Endangered Species Act* and S.A.R.A., are common in Kelly Stanton and larvae have been observed on milkweed plants in the E.S.A. At least 16 other Lepidoptera species have been observed in the E.S.A. American Dog Ticks (*Dermacentor variabilis*) are abundant in Kelly Stanton, especially in the spring.

A terrestrial crayfish (Cambaridae sp.) burrow was observed near Kelly Creek. Ontario is home to several species of terrestrial crayfish, which construct underground burrows in wet habitats with “chimneys” at their entrances. All terrestrial crayfish are of conservation concern and their habitat is considered S.W.H. (M.N.R.F., 2015).

3.5. Significant Wildlife Habitat

S.W.H. in Kelly Stanton E.S.A. was assessed using the S.W.H. Criteria Schedules for Ecoregion 7E (M.N.R.F., 2015) (see **Appendix 3**). S.W.H. discussed in the following sections is confirmed to occur in Kelly Stanton unless otherwise indicated. S.W.H. in the E.S.A. is illustrated on **Map 3 in Appendix 1**.

3.5.1. Seasonal Concentration Areas of Animals

Raptor Wintering Area (candidate)

The surrounding landscape contains a good mosaic of forest and open country habitat which is larger than 20 ha. The E.S.A. could therefore be a component of a significant raptor wintering area. Formal raptor surveys could be completed to confirm whether the area provides the minimum number of raptor use days to be considered significant.

Bat Maternity Colony (candidate)

A large number of dead ash trees in the south block of the E.S.A. (Polygon #s 21 and

23) may provide maternity habitat for Big Brown Bat (*Eptesicus fuscus*) and/or Silver-haired Bat (*Lasionycteris noctivagans*) and may occur at densities suitable for a maternity colony. A snag density survey and acoustic surveys for bats could be completed in the E.S.A. to confirm this.

3.5.2. Rare Vegetation Communities

Tallgrass Prairie

Kelly Stanton's tallgrass prairie communities are the signature feature of the E.S.A. These communities are remnants of pre-European vegetation and are extremely rare in Ontario. At least one tallgrass prairie community in Kelly Stanton – Polygon #3 – contains Mead's Sedge, an indicator species listed in Appendix N of the S.W.H. Technical Guide (MNR, 2000), which makes this community provincially significant.

3.5.3. Specialized Habitat for Wildlife

Amphibian Breeding Habitat (Woodland) (candidate)

Two indicator species – Spring Peeper and Western Chorus Frog – have been heard calling from vernal pools in Polygon #14 in the north block of Kelly Stanton E.S.A. during the breeding season. Call count surveys for breeding amphibians could be conducted to confirm whether these habitats are S.W.H.

Amphibian Breeding Habitat (Wetland) (candidate)

Two indicator species – American Toad and Western Chorus Frog – have been heard calling from vernal pools in Polygon #14 during the breeding season. Call count surveys for breeding amphibians could be conducted to confirm whether those features are S.W.H.

3.5.4. Habitat for Species of Conservation Concern

Marsh Bird Breeding Habitat (candidate)

Sedge Wren (*Cistothorus platensis*), an indicator species for this S.W.H. type, has been observed in suitable habitat in the E.S.A. during the breeding season. However, it is extremely unlikely that more than five pairs of Sedge Wrens breed in Kelly Stanton E.S.A. (the minimum number for the habitat to qualify as significant). No other indicator species have been observed in the E.S.A.

Shrub/Early Successional Bird Breeding Habitat

Both of the indicator species – Brown Thrasher (*Toxostoma rufum*) and Clay-coloured

Sparrow (*Spizella pallida*) – are probable breeders in Kelly Stanton E.S.A. Two of the common species are confirmed breeders – Field Sparrow (*Spizella pusilla*) and Eastern Towhee (*Pipilo erythrophthalmus*) – and another two are probable breeders – Black-billed Cuckoo (*Coccyzus erythrophthalmus*) and Willow Flycatcher (*Empidonax traillii*). The only indicator species which has not been observed in Kelly Stanton E.S.A. is Golden-winged Warbler (*Vermivora chrysoptera*). If vegetation communities in the north and south blocks are combined, there is over 10 ha of suitable early successional and shrub thicket habitat in the E.S.A. which would qualify as S.W.H. for these species.

Terrestrial Crayfish Habitat

Terrestrial crayfish burrows were observed in the Kelly Creek floodplain (Polygon #7) and may also occur elsewhere in the E.S.A. Wet to moist communities adjacent to Kelly Creek are therefore S.W.H. for terrestrial crayfish.

Habitat for Species of Conservation Concern

Table 6 lists the Special Concern and provincially rare plant and wildlife species in Kelly Stanton E.S.A. and describes their habitats which are S.W.H., if any.

Table 6. Species of conservation concern in Kelly Stanton E.S.A.

Species	Status[1]	Polygon(s)	Habitat
Plants			
False Tomentose Balsam Ragwort *Packera paupercula var. pseudotomentosa*	S.A.R.A. – n/a E.S.A. – n/a N.H.I.C. – S2S3	10	Prairies, savannahs and dry, open places (MNR, 2000).
Mead's Sedge *Carex meadii*	S.A.R.A. – n/a E.S.A. – n/a N.H.I.C. – S2	3	Prairies (MNR, 2000).
Birds			
Eastern Wood-pewee *Contopus virens*	S.A.R.A. – SC E.S.A. – SC N.H.I.C. – S4B	7, 12, 14, 21, 23	Open, deciduous, mixed or coniferous forest; predominated by oak with little understory; forest clearings, edges; farm woodlots, parks (MNR, 2000).
Grasshopper Sparrow *Ammodramus savannarum*	S.A.R.A. – SC E.S.A. – SC	3, 8, 10	Well-drained grassland or prairie with low cover of grasses, taller weeds on sandy

Species	Status[1]	Polygon(s)	Habitat
	N.H.I.C. – S4B		soil; hayfields or weedy fallow fields; uplands with ground vegetation of various densities; perches for singing; requires tracts of grassland >10 ha (MNR, 2000).
Olive-sided Flycatcher *Contopus cooperi*	S.A.R.A. – THR E.S.A. – SC N.H.I.C. – S4B	n/a	Stops over during migration but does not breed in the E.S.A.
Rusty Blackbird *Euphagus carolinus*	S.A.R.A. – SC E.S.A. – SC N.H.I.C. – S4B	n/a	Stops over during migration but does not breed in the E.S.A.
Reptiles			
Eastern Milksnake *Lampropeltis triangulum*	S.A.R.A. – SC E.S.A. – NAR N.H.I.C. – S4	All	Farmlands, meadows, hardwood or aspen stands; pine forest with brushy or woody cover; river bottoms or bog woods; hides under logs, stones, or boards or in outbuildings; often uses communal nest sites (MNR, 2000).
Insects			
Monarch *Danaus plexippus*	S.A.R.A. – SC E.S.A. – SC N.H.I.C. – S2N, S4B	All	Any habitat containing milkweed plants, the larvae's primary food source.

[1]S.A.R.A.: Status on Schedule 1 of the S.A.R.A. (2002) (SC – Special Concern, THR – Threatened); E.S.A.: Status on the provincial *Endangered Species Act* (2007) (SC – Special Concern, NAR – Not at Risk); N.H.I.C.: provincial conservation status (S2 – Imperiled, S2S3 – Imperiled or Vulnerable, S4 – Apparently Secure, B – breeding, N – nesting).

3.5.5. Animal Movement Corridors

Amphibian Movement Corridors (candidate)

There may be localized movement corridors of frogs and toads which breed in vernal

pools in Polygon #14 in the north block and move into adjacent forests and thickets outside of the breeding season.

Other Animal Movement Corridors

Well established deer trails occur throughout the north block of the E.S.A., especially in prairie and thicket communities towards the western end. Coyotes and other wildlife were observed using these trails.

3.6. Species at Risk

Kelly Stanton E.S.A. provides habitat for at least three species listed as Threatened under the provincial *Endangered Species Act* (2007) and the federal *Species at Risk Act* (2002). These are listed in **Table 7.**

Table 7. S.A.R. in Kelly Stanton E.S.A.

Species	Status[1]	Polygon(s)	Habitat
Barn Swallow *Hirundo rustica*	S.A.R.A. – THR E.S.A. – THR N.H.I.C. – S4B	n/a	Barn Swallows do not breed in Kelly Stanton since there are no suitable barns, culverts or other structures for them to nest in. However, they forage over the E.S.A. in large numbers, especially during migration.
Bobolink *Dolichonyx oryzivorus*	S.A.R.A. – THR E.S.A. – THR N.H.I.C. – S4B	n/a	Although Bobolinks have been seen in Kelly Stanton during migration, no evidence of breeding has been documented. It is possible that the relatively small area of suitable habitat cannot support breeding Bobolinks, especially in competition with other grassland birds that breed in the E.S.A. Restoration of open country habitat in the E.S.A. (particularly Polygon #3) could improve the habitat available for Bobolinks.
Eastern Meadowlark *Sturnella magna*	S.A.R.A. – THR E.S.A. – THR	3, 8, 10	Eastern Meadowlarks have been confirmed to breed in Polygon #8, the largest grassland unit in the E.S.A., for multiple years in a row.

Species	Status[1]	Polygon(s)	Habitat
	N.H.I.C. – S4B		

[1]S.A.R.A.: Status on Schedule 1 of the S.A.R.A. (2002) (THR – Threatened); E.S.A.: Status on the provincial *Endangered Species Act* (2007) (THR – Threatened); N.H.I.C.: provincial conservation status (S4 – Apparently Secure, B – breeding).

4. Ecological Restoration Plan

4.1. Restoration Overlays

Table 8 lists the restoration overlays which should guide restoration and management activities in Kelly Stanton E.S.A. Restoration overlays are illustrated on **Map 4 in Appendix 1**. Restoration overlays have first been categorized based on the target vegetation community for restoration, with the understanding that restoring and maintaining prairie, forest, thicket and wetland communities require different approaches. The following levels of restoration priority were assigned to each polygon and are illustrated on **Map 5 in Appendix 1**:

- Priority 1 (High)
- Priority 2 (Medium)
- Priority 3 (Low)

Restoration priority should be interpreted as reflecting the timeline and effort to be applied to restoration activities in each polygon. However, as discussed in **Section 4.4**, an adaptive management approach should be applied, so that priorities can be periodically reviewed and changed based on changing conditions in the E.S.A. or development of new threats, such as new invasive species occurrences.

For a list of individual polygons in Kelly Stanton E.S.A. with their specific restoration overlays and management recommendations, see **Appendix 4**.

Table 8. Restoration overlays and associated restoration activities in Kelly Stanton E.S.A.

ID	Area (ha)	Description	Restoration Activities	Volunteer Opportunities	Priority
RO1a		Tallgrass prairie maintenance: general maintenance and monitoring	Monitor for new invasive species occurrences and remove as required; monitor proportion of forbs and cool	Yes	High to Medium

ID	Area (ha)	Description	Restoration Activities	Volunteer Opportunities	Priority
		Polygon #s 10, 20	season grasses vs. warm season grasses and consider controlled burn if proportion of forbs/cool season grasses exceeds 50%.		
RO1b		Tallgrass prairie maintenance: shrub removal, controlled burn Polygon #3	Remove encroaching shrubby vegetation; consider conducting a controlled burn; monitor for new invasive species occurrences and proportion of forbs and cool season grasses vs. warm season grasses and consider controlled burn if proportion of forbs/cool season grasses exceeds 50%.	Yes	High
RO2a		Tallgrass prairie restoration: cultural meadow to tallgrass prairie Polygon #s 1, 8, 17	Consider controlled burn; hand sow native prairie grasses and wildflowers, ideally collected from other parts of Kelly Stanton. Monitor as described above.	Yes	Medium
RO2b		Tallgrass prairie restoration: cultural thicket to tallgrass prairie Polygon #s 2, 4, 6, 11, 13, 16, 19	Remove shrubby vegetation; hand sow native prairie grasses and wildflowers, ideally collected from other parts of Kelly	Yes	Medium to Low

ID	Area (ha)	Description	Restoration Activities	Volunteer Opportunities	Priority
			Stanton. Monitor as described above.		
RO3		Forest maintenance: buckthorn management Polygon #s 12, 14, 21	Remove buckthorn in subcanopy, understory and groundcover; monitor buckthorn cover and for other invasive species and manage as required.	Yes	Medium to Low
RO4a		Forest restoration: tree planting Polygon #24	Plant native trees, ideally species which are characteristic of forest communities in Kelly Stanton (e.g., Bitternut Hickory, Sugar Maple, Northern Hackberry, American Beech).	Yes	Low
RO4b		Forest restoration: buckthorn management, tree planting Polygon #23	Remove buckthorn; plant native trees, ideally species which are characteristic of forest communities in Kelly Stanton; monitor buckthorn cover and for other invasive species and manage as required.	Yes	Low

4.1.1. Invasive Species Management

Invasive species management activities outlined in **Table 8** shall be consistent with the recommended approach in the L.I.P.M.S (City of London, 2017), which identifies that methods of invasive species removal shall follow B.M.P.s developed by O.I.P.C. Using B.M.P.s ensures that City-funded invasive species management activities will be as

effective as possible, especially when implemented by experienced professionals in the E.S.A. Management Team.

Where invasive species management is recommended, this will typically be the first step in restoring communities and should be conducted along with other activities to help guide natural succession towards a self-sustaining natural vegetation community. Other activities could include controlled burns and/or revegetating cleared areas with native plants. There may be opportunities for community volunteers to collect seeds from native plants in the E.S.A. in order to revegetate cleared areas with seeds from local genetic stock.

4.1.2. Controlled Burns

Controlled burns will be an important tool for restoring tallgrass prairie communities in Kelly Stanton E.S.A. Burns are recommended for communities which retain propagules of tallgrass prairie species in their seedbanks, particularly Polygon #s 3 and 8. Manual removal of shrubby vegetation will be necessary in Polygon #3 prior to undertaking a burn.

Controlled burns do not necessarily 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.

How to determine where a controlled burn is required: 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 which are currently dominated by prairie grasses (e.g., Polygon #s 10, 20) do not currently require a burn but the relative proportions of these types of vegetation cover should be monitored over time.

4.1.3. Seeding and Planting

In communities which are currently dominated by invasive alien species, native plants may need to be introduced. Native seedbanks in communities dominated by invasive species, especially buckthorn, can be severely depleted and early successional vegetation after invasive species removal is likely to consist of more invasive plants. Planting native species plugs or manually spreading native seeds will help to ensure restoration success in these areas.

Manually spreading seeds of native prairie species after undertaking controlled burns could help promote regeneration of prairie vegetation. Kelly Stanton still retains a considerable amount of native prairie vegetation and there are opportunities for

volunteers to collect seeds from the E.S.A. itself to use for restoration. This will preserve local genetic diversity and ensure that restored vegetation is adapted to local environmental conditions.

4.2. Resources

4.2.1. Funding Sources

The costs of restoration activities are difficult to estimate and will vary based on many factors such as the use of volunteers versus professional contractors. Costs have therefore not been estimated for the E.R.P. It is anticipated that the majority of implementation will be done under the City's U.T.R.C.A. E.S.A. management contract. Large, complex restoration projects may be implemented through the City's E.S.A. capital budget and/or the City's Woodland Acquisition and Management Fund. Other sources of funding could include fundraising by local community groups and grants from federal and/or provincial agencies for specific restoration projects.

4.2.2. London's E.S.A. Management Team

The City of London has retained a team of experts at U.T.R.C.A. to conduct management activities in the City's E.S.A.s. Under the direction of City planning staff, the E.S.A. Management Team conducts the following general activities in London's E.S.A.s:

- Monitoring and enhancing natural resources (40% of the time)
- Developing and maintaining trail networks (30% of the time)
- Enforcing provincial regulations and City by-laws, including encroachment (20% of the time)
- Risk management, structure inspections and hazard tree programs (5% of the time)
- Coordinating educational programs, special events and community projects (5% of the time)

The E.S.A. Management Team has undertaken *Phragmites* control at three locations in the E.S.A.'s south block (in Polygon #s 23 and 24). It is anticipated that the majority of restoration activities recommended in **Section 4.1** will be undertaken by the E.S.A. Management Team, under the direction of the City and using City funding.

4.2.3. Adopt-an-E.S.A. Program and Community Volunteers

The City encourages civic clubs, local businesses, neighbourhood associations, faith groups and school groups to get involved in the preservation and enhancement of City-

owned E.S.A.s. By participating in the Adopt-an-E.S.A. program, volunteers donate time and resources to give special care to an E.S.A. by helping to maintain, enhance and protect its natural features and functions. Groups signed up to the Adopt-an-E.S.A. program commit to helping maintain the adopted area of the E.S.A. for a minimum of two years, with a minimum of two community-led clean-up events each year.

The Neighbours of Hunt Club adopted the north part of the E.S.A. in mid-2020 to help with stewardship of Kelly Stanton E.S.A. through the Adopt-an-E.S.A. program. monitor and maintain with stewardship in Kelly Stanton E.S.A. through the Adopt-an-E.S.A. program. They are to be commended for their initiative in removing litter from the E.S.A. with the community. This could help raise awareness about the significant ecological features in the E.S.A. within the local community and across the city. Local naturalists have already taken an interest in the E.S.A. and could contribute to long-term monitoring as described in **Section 4.3**. Citizen science platforms, such as iNaturalist and eBird, should be utilized as part of long-term monitoring and focused monitoring events, such as BioBlitz's, could be organized. Volunteers could also be used for invasive species removal projects (specifically, projects which do not require a pesticide applicator's license or other professional licenses) or community seed collection or planting events.

4.3. Restoration Targets and Monitoring Objectives

4.3.1. Monitoring Program

A monitoring program should be implemented to measure the success of restoration activities and document ecological changes in Kelly Stanton E.S.A. that may trigger a management response. Monitoring is a critical component of any E.R.P. and is also part of the B.M.P.s for invasive plant species recommended by O.I.P.C. and the L.I.P.M.S. Monitoring activities could be undertaken by the E.S.A. Management Team or by local naturalists (e.g., Nature London, Adopt-an-E.S.A. volunteers). Two major elements of the monitoring plan are:

- **Early Detection and Rapid Response (E.D.R.R.) for Invasive Species:** New populations of invasive species already present in the E.S.A. may appear in new locations and new invasive species not yet recorded in the E.S.A. may be introduced as time goes on. Early detection of these species is critical for preventing invasions and detrimental impacts to native plants and wildlife. Monitoring will make use of the E.D.R.R. system for invasive species as recommended by O.I.P.C. and laid out in the L.I.P.M.S.
- **Vegetation Monitoring:** Vegetation community composition will be monitored following the implementation of management activities in order to determine

management effectiveness. This may include monitoring tallgrass prairie communities for changes in tallgrass prairie vegetation cover and monitoring invasive species cover in invasive species management areas. The presence and abundance of indicator species will be monitored.

Specific monitoring tasks could consist of:

1. **S.A.R. and Species of Conservation Concern Monitoring:** Monitoring of Eastern Meadowlark, Mead's Sedge, False Tomentose Balsam Ragwort and other species of conservation concern for population fluctuations and threats to their survival. Every 5 years.
2. **Vegetation Community Monitoring:** Monitoring vegetation composition in tallgrass prairie communities to document encroachment of shrubby vegetation, forbs and cool season grasses that should be addressed; monitoring of invasive species populations to determine success of management activities and identify areas where additional management is required; monitoring of all vegetation communities for new populations of invasive species, especially Dog-strangling Vine, *Phragmites* and buckthorns. Every 5 years.
3. **Indicator Species Monitoring:** Monitoring of indicator species of rare vegetation communities and S.W.H. to document environmental changes that could warrant a management response (e.g., Mead's Sedge, breeding amphibians, marsh birds, grassland birds, shrub/early successional birds, terrestrial crayfish). Every 5 years.

4.4. Adaptive Management Approach

An adaptive management approach should be used throughout the implementation of this plan. Adaptive management means that components of this plan can be modified as environmental conditions change, new challenges develop, new technologies emerge or new scientific knowledge emerges (e.g., new B.M.P.s for invasive species management). The monitoring program outlined in **Section 4.3** should serve to capture environmental changes that could affect restoration objectives and activities. Restoration objectives and activities should be modified if monitoring results indicate that the actions recommended in this plan are not improving ecological integrity or if new threats to ecological integrity have developed. Restoration activities can also be modified if new challenges emerge, such as damage to vegetation from major disturbance events (e.g., storms, floods) that require a response over and beyond the recommendations of this plan. The E.R.P. should not be read as a static document but should be modified as needed while maintaining the fundamental principles of improving ecological integrity through the restoration of natural vegetation communities.

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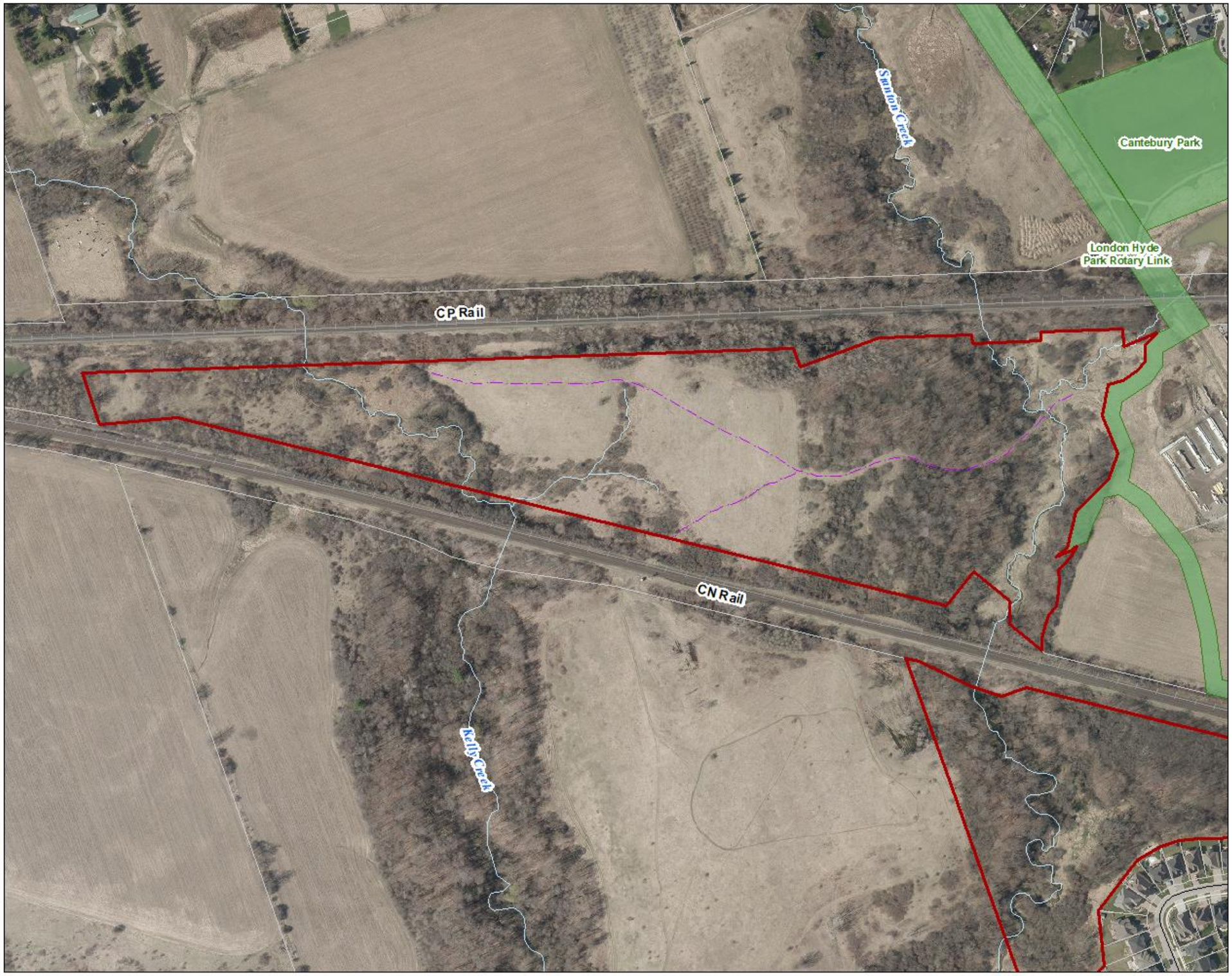
APPENDIX 1 | Maps



Map 1A | Kelly Stanton ESA Study Area

Legend

- Publicly Owned ESA Lands
- Assessment Parcels
- Roads
- Railways
- Existing Trails
- Watercourses
- Public Parks

0 50 100 150 200 Meters

Project Number	Date:	N
20-1127	2020-12-11	

north-south ENVIRONMENTAL

Map 1B | Kelly Stanton ESA Study Area

Legend

- Publicly Owned ESA Lands
- Assessment Parcels
- Roads
- Railways
- Existing Trails
- Watercourses
- Public Parks

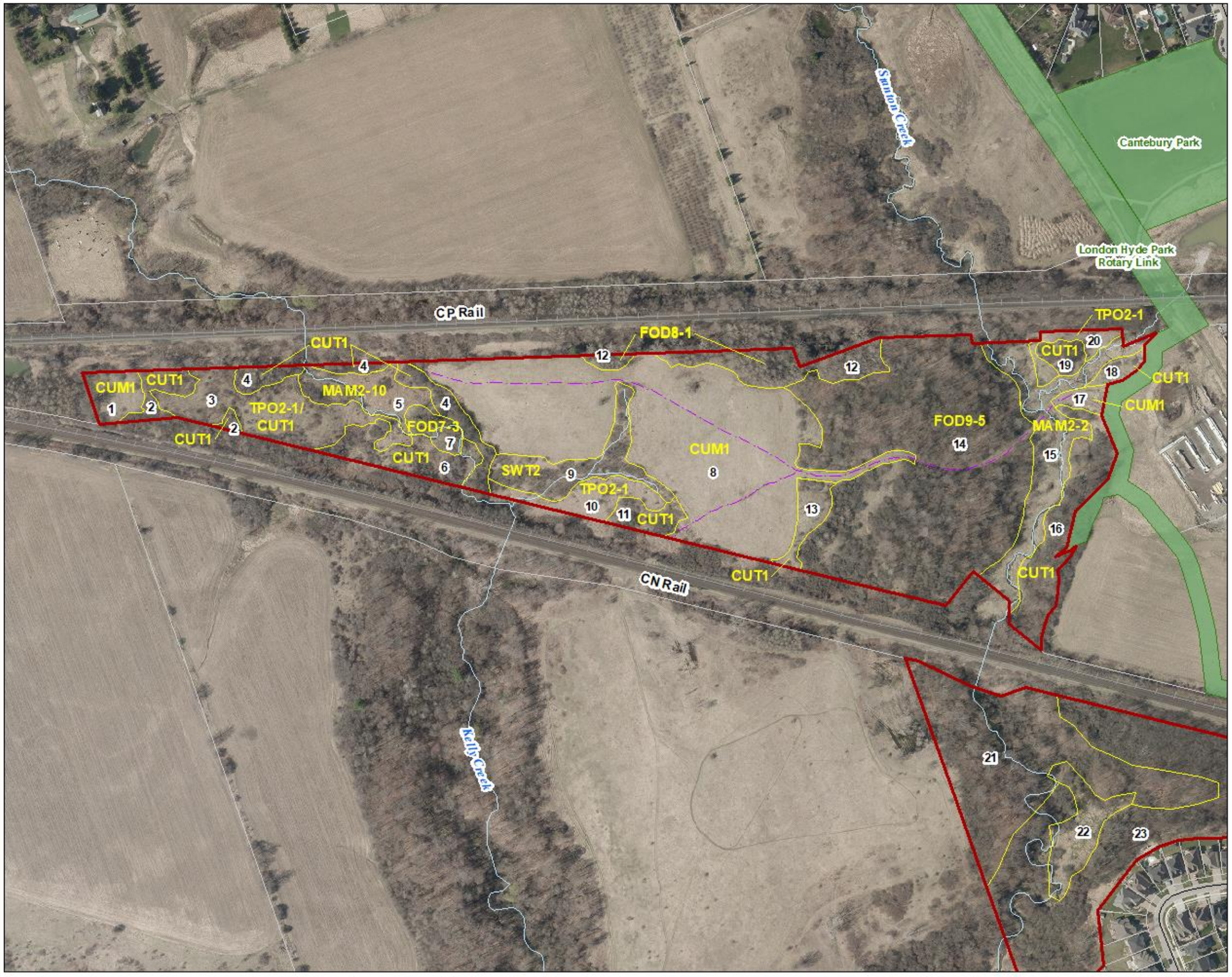
0 50 100 150 200 Meters

Project Number	Date:	N
20-1127	2020-12-11	

Data Provided by: North South Environmental Inc.
Imagery: City of London, 2017

north-south ENVIRONMENTAL

Map 2A | Kelly Stanton ESA Vegetation Communities



Legend

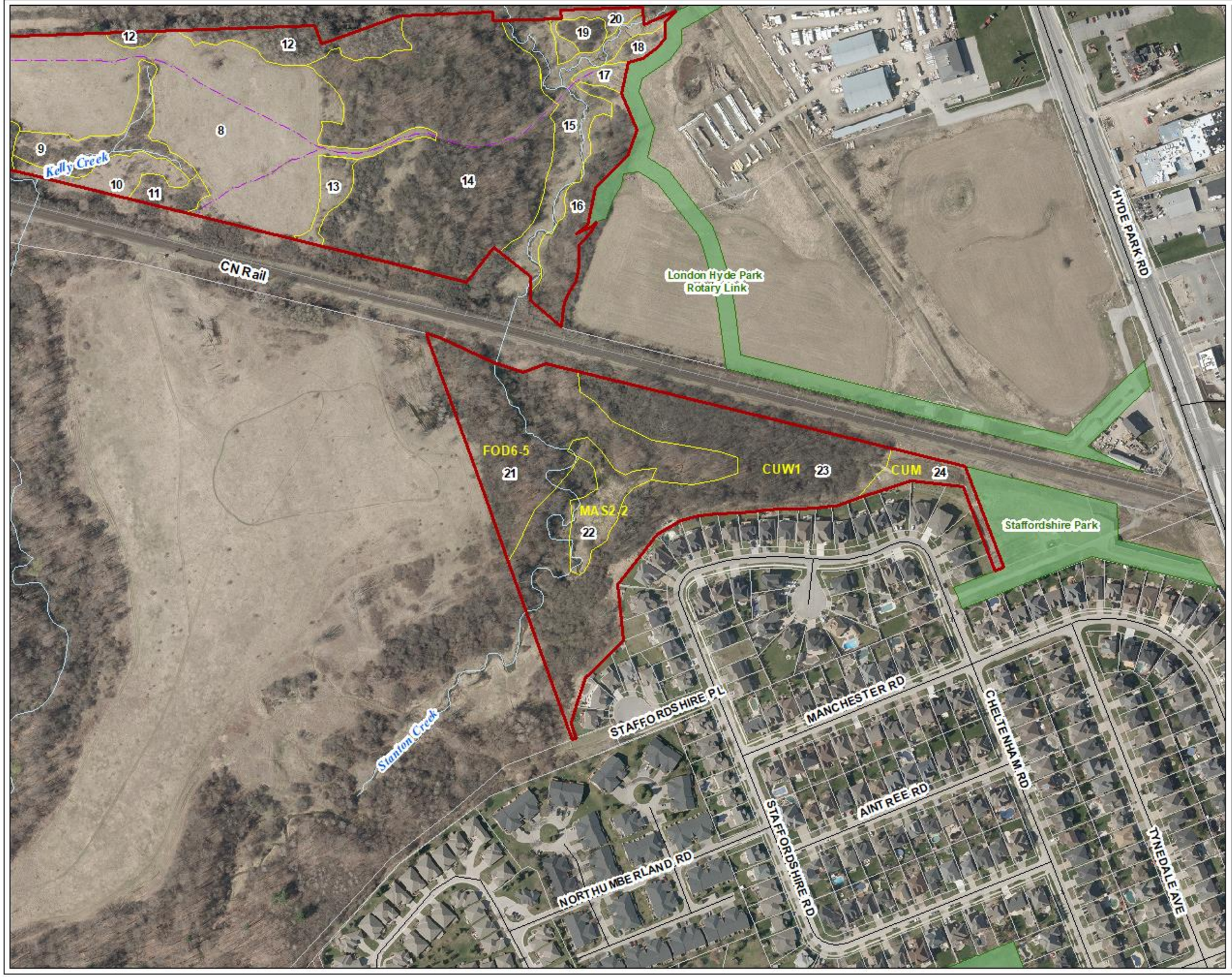
- Publicly Owned ESA Lands
- Assessment Parcels
- Roads
- Railways
- Existing Trails
- Watercourses
- Public Parks
- Vegetation Communities

CUM - Cultural Meadow
CUM1 - Mineral Cultural Meadow
CUT1 - Mineral Cultural Thicket
CUW - Cultural Woodland
FOD6-5 - Fresh-Moist Sugar Maple - Hardwood Deciduous Forest
FOD7-3 - Fresh-Moist Willow Lowland Deciduous Forest
FOD8-1 - Fresh-Moist Poplar Deciduous Forest
FOD9-5 - Fresh-Moist Bitternut Hickory Deciduous Forest
MAM2-10 - Forb Mineral Meadow Marsh
MAM2-2 - Reed Canary Grass Mineral Meadow Marsh
MAS2-2 - Bulrush Mineral Shallow Marsh
SWT2 - Alder Mineral Deciduous Thicket Swamp
TPO2-1 - Fresh-Moist Tallgrass Prairie

0 50 100 150 200 Meters

Project Number	Date:	N
20-1127	2020-12-11	

north-south ENVIRONMENTAL



Map 2B | Kelly Stanton ESA Vegetation Communities

Legend

- Publicly Owned ESA Lands
- Assessment Parcels
- Roads
- Railways
- Existing Trails
- Watercourses
- Public Parks
- Vegetation Communities

CUM - Cultural Meadow
CUM1 - Mineral Cultural Meadow
CUT1 - Mineral Cultural Thicket
CUW - Cultural Woodland
FOD6-5 - Fresh-Moist Sugar Maple - Hardwood Deciduous Forest
FOD7-3 - Fresh-Moist Willow Lowland Deciduous Forest
FOD8-1 - Fresh-Moist Poplar Deciduous Forest
FOD9-5 - Fresh-Moist Bitternut Hickory Deciduous Forest
MAM2-10 - Forb Mineral Meadow Marsh
MAM2-2 - Reed Canary Grass Mineral Meadow Marsh
MAS2-2 - Bulrush Mineral Shallow Marsh
SWT2 - Alder Mineral Deciduous Thicket Swamp
TPO2-1 - Fresh-Moist Tallgrass Prairie

0 50 100 150 200 Meters

Project Number	Date:	N
20-1127	2020-12-11	

north-south ENVIRONMENTAL

Map 3A | Kelly Stanton ESA Significant Wildlife Habitat

Legend

- Publicly Owned ESA Lands
- Assessment Parcels
- Roads
- Railways
- Existing Trails
- Watercourses
- Public Parks

Rare Vegetation Communities

- Tallgrass Prairie

Specialized Habitat for Wildlife

- Amphibian Breeding Habitat (Candidate)

Seasonal Concentration Areas of Animals

- Bat Maternity Colony (Candidate)

Habitat for Species of Conservation Concern

- Marsh Bird Breeding Habitat (Candidate)
- Shrub/Early-successional Bird Breeding Habitat
- Terrestrial Crayfish Habitat
- Habitat for False Tomentose Balsam Ragwort
- Habitat for Mead's Sedge
- Habitat for Eastern Wood-Pewee
- Habitat for Grasshopper Sparrow

0 50 100 150 200 Meters

Project Number	Date:	N
20-1127	2020-12-11	

north-south ENVIRONMENTAL

Map 3B | Kelly Stanton ESA Significant Wildlife Habitat

Legend

- Publicly Owned ESA Lands
- Assessment Parcels
- Roads
- Railways
- Existing Trails
- Watercourses
- Public Parks

Rare Vegetation Communities

- Tallgrass Prairie

Specialized Habitat for Wildlife

- Amphibian Breeding Habitat (Candidate)

Seasonal Concentration Areas of Animals

- Bat Maternity Colony (Candidate)

Habitat for Species of Conservation Concern

- Marsh Bird Breeding Habitat (Candidate)
- Shrub/Early-successional Bird Breeding Habitat
- Terrestrial Crayfish Habitat
- Habitat for False Tomentose Balsam Ragwort
- Habitat for Mead's Sedge
- Habitat for Eastern Wood-Pewee
- Habitat for Grasshopper Sparrow

0 50 100 150 200 Meters

Project Number	Date:	N
20-1127	2020-12-11	

north-south ENVIRONMENTAL

Map 4A | Kelly Stanton ESA Restoration Overlays

Legend

- Publicly Owned ESA Lands
- Assessment Parcels
- Roads
- Railways
- Existing Trails
- Watercourses
- Public Parks

Restoration Overlays

Restoration Overlay 1: Tallgrass Prairie Maintenance

- RO1a - General Maintenance and Monitoring
- RO1b - Shrub Management; Controlled Burn

Restoration Overlay 2: Tallgrass Prairie Restoration

- RO2a - Cultural Meadow to Tallgrass Prairie
- RO2b - Cultural Thicket to Tallgrass Prairie

Restoration Overlay 3: Forest Maintenance

- RO3a - Buckthorn Management

Restoration Overlay 4: Forest Restoration

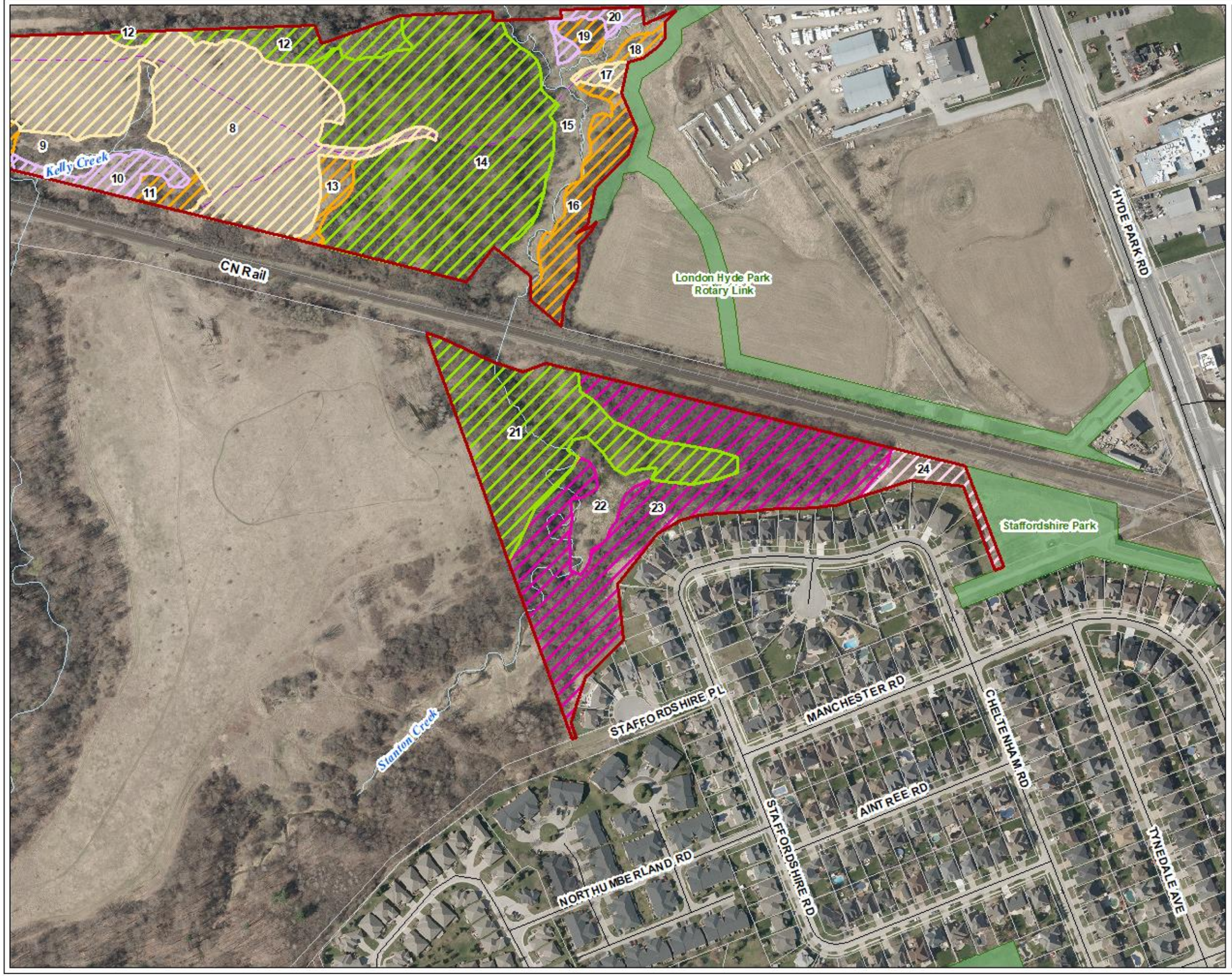
- RO4a - Tree Planting
- RO4b - Buckthorn Management; Tree Planting

0 50 100 150 200 Meters

Project Number	Date:	N
20-1127	2020-12-11	

north-south ENVIRONMENTAL

Map 4B | Kelly Stanton ESA Restoration Overlays



Legend

- Publicly Owned ESA Lands
- Assessment Parcels
- Roads
- Railways
- Existing Trails
- Watercourses
- Public Parks

Restoration Overlays

Restoration Overlay 1: Tallgrass Prairie Maintenance

- RO1a - General Maintenance and Monitoring
- RO1b - Shrub Management; Controlled Burn

Restoration Overlay 2: Tallgrass Prairie Restoration

- RO2a - Cultural Meadow to Tallgrass Prairie
- RO2b - Cultural Thicket to Tallgrass Prairie

Restoration Overlay 3: Forest Maintenance

- RO3a - Buckthorn Management

Restoration Overlay 4: Forest Restoration

- RO4a - Tree Planting
- RO4b - Buckthorn Management; Tree Planting

0 50 100 150 200 Meters

Project Number	Date:	N
20-1127	2020-12-11	

north-south ENVIRONMENTAL

Map 5A | Kelly Stanton ESA Restoration Priorities

Legend

- Publicly Owned ESA Lands
- Assessment Parcels
- Roads
- Railways
- Existing Trails
- Watercourses
- Public Parks

Restoration Priorities

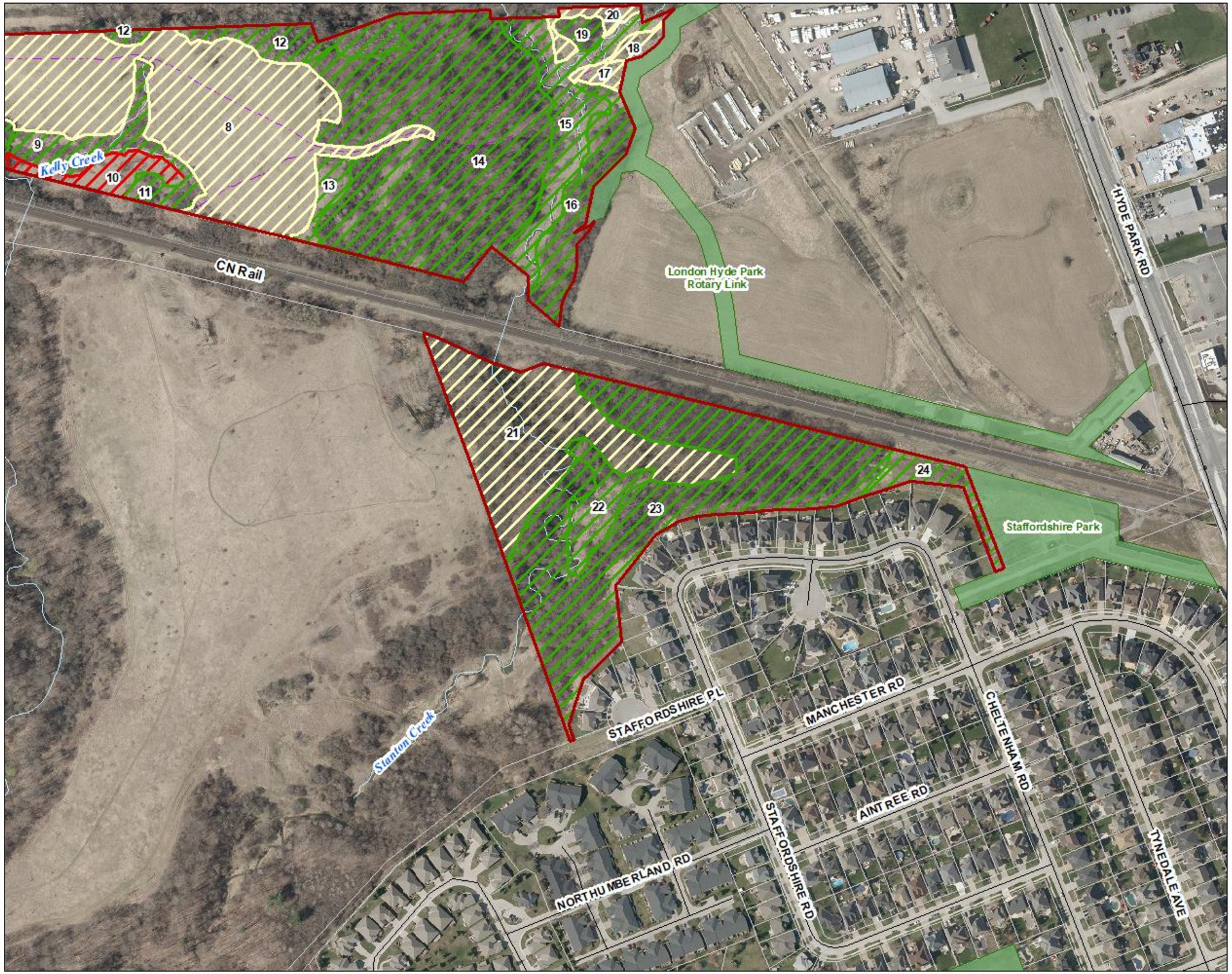
- High
- Medium
- Low

0 50 100 150 200 Meters

Project Number	Date:	N
20-1127	2020-12-11	

north-south ENVIRONMENTAL

Map 5B | Kelly Stanton ESA Restoration Priorities



Legend

- ESA Boundaries
- Assessment Parcels
- Roads
- Railways
- Existing Trails
- Watercourses
- Public Parks

Restoration Priorities

- High
- Medium
- Low

0 50 100 150 200 Meters

N

Project Number	Date:
20-1127	2020-12-11

north-south ENVIRONMENTAL

APPENDIX 2 | Species Lists

Table 2.1 – List of plant species identified in Kelly Stanton E.S.A.

Family	Scientific Name	Common Name	Source[1]	SRank[2]	RRank[3]	Vegetation Community						
						CUM	CUT	CUW	FOD	MAM	SWT	TPO
Adoxaceae	*Sambucus canadensis*	Black Elderberry	NSE	S5	X					✓	✓	
	Viburnum opulus var. opulus	European Cranberry Viburnum	iNaturalist	SE5	IR		✓		✓			
Amaryllidaceae	*Allium tricoccum var. tricoccum*	Wide-leaved Wild Leek	NSE	S5	C				✓			
Amblystegiaceae	*Hygroamblystegium varium*	Tangled Thread Moss	NSE	S5					✓			
Anacardiaceae	*Rhus typhina*	Staghorn Sumac	NSE	S5	C	✓	✓					✓
	Rhus x borealis	Northern Sumac	NSE	SNA	hyb			✓				
	Toxicodendron radicans	Climbing Poison Ivy	NSE	S5	C	✓	✓	✓	✓			
Apiaceae	*Daucus carota*	Wild Carrot	NSE	SE5	IC	✓						✓
	Torilis japonicus	Upright Hedge Parsley	NSE	SE3	IR				✓			
Apocynaceae	*Apocynum androsaemifolium*	Spreading Dogbane	NSE	S5	C	✓						✓
	Apocynum cannabinum	Hemp Dogbane	NSE	S5	C	✓						
	Asclepias incarnata	Swamp Milkweed	NSE	S5	C					✓	✓	
	Asclepias syriaca	Common Milkweed	NSE	S5	C	✓						✓
	Asclepias tuberosa	**Butterfly Milkweed**	**NSE**	**S4**	**R**							✓
	Vincetoxicum rossicum	Dog-strangling Vine	NSE	SE5	IR				✓			
Araceae	*Arisaema triphyllum*	Jack-in-the-pulpit	NSE	S5	C				✓			
	Symplocarpus foetidus	Eastern Skunk Cabbage	NSE	S5	C				✓			
Asteraceae	*Achillea millefolium*	Common Yarrow	NSE	S5	C	✓						✓
	Ambrosia artemisiifolia	Eastern Ragweed	NSE	S5	C	✓						✓
	Bidens frondosa	Devil's Beggarticks	NSE	S5	X				✓	✓		
	Centaurea jacea	Brown Knapweed	NSE	SE5	IX	✓						
	Centaurea stoebe	Spotted Knapweed	NSE	SE5	IX	✓						
	Centaurea x moncktonii	Monckton's Knapweed	NSE	SE	hyb	✓						
	Cichorium intybus	Chicory	NSE	SE5	IC	✓						
	Cirsium arvense	Creeping Thistle	NSE	SE5	IC	✓						
	Cirsium vulgare	Bull Thistle	NSE	SE5	IX	✓						
	Erigeron pulchellus	Robin's Plantain	NSE	S5	X	✓						
	Erigeron strigosus	Daisy Fleabane	NSE	S5	C	✓	✓	✓	✓			✓
	Eupatorium perfoliatum	Common Boneset	NSE	S5	C	✓				✓		
	Euthamia graminifolia	Grass-leaved Goldentop	NSE	S5	C	✓						✓
	Eutrochium maculatum	Spotted Joe-Pye-weed	NSE	S5	C					✓	✓	
	Lactuca canadensis	Canada Wild Lettuce	iNaturalist	S5	X				✓			
	Leucanthemum vulgare	Oxeye Daisy	NSE	SE5	IC	✓	✓					✓
	Packera paupercula var. pseudotomentosa	**False Tomentose Balsam Ragwort**	**NSE**	**S2S3**	**R**							✓
	Pilosella piloselloides	Smooth Hawkweed	NSE	SE5	IR	✓						
	Rudbeckia hirta	Black-eyed Susan	NSE	S5	C	✓						✓
	Solidago altissima	Late Goldenrod	NSE	S5	U	✓						✓
	Solidago caesia	Blue-stemmed Goldenrod	NSE	S5	X				✓			
	Solidago canadensis	Canada Goldenrod	NSE	S5	X		✓					
	Solidago flexicaulis	Zigzag Goldenrod	NSE	S5	X				✓			
	Solidago gigantea	Tall Goldenrod	NSE	S5	X				✓	✓		

Family	Scientific Name	Common Name	Source[1]	SRank[2]	RRank[3]	Vegetation Community						
						CUM	CUT	CUW	FOD	MAM	SWT	TPO
	Solidago juncea	Early Goldenrod	NSE	S5	X	✓						✓
	Solidago nemoralis	Grey Goldenrod	NSE	S5	X	✓						✓
	Symphyotrichum ericoides	Heath Aster	NSE	S5	C	✓						✓
	Symphyotrichum laeve	Smooth Aster	NSE	S5	C	✓						✓
	Symphyotrichum lanceolatum	Panicled Aster	NSE	S5	C	✓				✓	✓	
	Symphyotrichum lateriflorum	Calico Aster	NSE	S5	C		✓	✓	✓			
	Symphyotrichum novae-angliae	New England Aster	NSE	S5	C	✓						
	Symphyotrichum pilosum var. *pilosum*	Frost Aster	NSE	S5	U	✓						✓
	Symphyotrichum puniceum	Swamp Aster	NSE	S5	X	✓				✓	✓	
	Symphyotrichum urophyllum	Arrow-leaved Aster	NSE	S4	X	✓						✓
	Tragopogon pratensis	Yellow Salsify	NSE	SE5	IX		✓					
Athyriaceae	*Athyrium angustum*	Northern Lady Fern	NSE	S5	X				✓			
Balsaminaceae	*Impatiens capensis*	Spotted Jewelweed	NSE	S5	C	✓	✓	✓	✓	✓	✓	
	Impatiens pallida	Pale Jewelweed	NSE	S4	X				✓			
Berberidaceae	*Podophyllum peltatum*	Mayapple	NSE	S5	X				✓			
Betulaceae	*Carpinus caroliniana*	American Hornbeam	NSE	S5	C				✓			
	Ostrya virginiana	Hop-hornbeam	NSE	S5	C				✓			
Boraginaceae	*Echium vulgare*	Viper's Bugloss	NSE	SE5	IC	✓						
Brassicaceae	*Alliaria petiolata*	Garlic Mustard	NSE	SE5	IC		✓	✓	✓			
	Barbarea vulgaris	Yellow Rocket	NSE	SE5	IC	✓						
	Cardamine bulbosa	Bulbous Cress	iNaturalist	S4	X					✓	✓	
	Diplotaxis muralis	Annual Wall Rocket	NSE	SE3	IR	✓						
	Hesperis matronalis	Dame's Rocket	NSE	SE5	IX			✓	✓			
Campanulaceae	*Lobelia inflata*	Indian Tobacco	NSE	S5	X				✓			
Caprifoliaceae	*Lonicera x bella*	Bell's Honeysuckle	NSE	SE	hyb				✓			
	Symphoricarpos albus	Common Snowberry	NSE	S5	X				✓			
	Triosteum aurantiacum	Orange-fruited Horse-gentian	NSE	S5	X	✓			✓			
Caryophyllaceae	*Dianthus armeria*	Deptford Pink	NSE	SE5	IX	✓	✓					
	Silene latifolia	White Campion	NSE	SE5	IX	✓	✓	✓	✓			
	Stellaria media	Common Chickweed	NSE	SE5	IC				✓			
Conocephalaceae	*Conocephalum salebrosum*	Snakewort	iNaturalist	S5					✓			
Convolvulaceae	*Calystegia sepium*	Hedge Bindweed	NSE	S5	X	✓						✓
	Convolvulus arvensis	Field Bindweed	NSE	SE5	IX	✓						
Cornaceae	*Cornus amomum*	Silky Dogwood	NSE	S5	X		✓				✓	
	Cornus racemosa	Grey Dogwood	NSE	S5	X	✓	✓	✓	✓		✓	✓
	Cornus sericea	Red Osier Dogwood	NSE	S5	C					✓		
Cucurbitaceae	*Echinocystis lobata*	Wild Cucumber	NSE	S5	X	✓	✓	✓	✓	✓	✓	
Cupressaceae	*Juniperus virginiana*	Eastern Red Cedar	NSE	S5	X	✓						✓
Cuscutaceae	*Cuscuta gronovii*	Common Dodder	NSE	S5	C					✓		
Cyperaceae	*Carex arctata*	Drooping Woodland Sedge	iNaturalist	S5	C				✓			
	Carex aurea	Golden Sedge	NSE	S5	C	✓						✓
	Carex flacca	Blue Sedge	NSE	SE2	IR	✓						
	Carex flava	Yellow-green Sedge	NSE	S5	C	✓						✓

Family	Scientific Name	Common Name	Source[1]	SRank[2]	RRank[3]	Vegetation Community						
						CUM	CUT	CUW	FOD	MAM	SWT	TPO
	Carex granularis	Limestone Meadow Sedge	NSE	S5	C	✓						✓
	Carex hirtifolia	Hairy-leaved Sedge	NSE	S4S5	C				✓			
	Carex hystericina	Bottlebrush Sedge	NSE	S5	C					✓	✓	
	Carex lacustris	Lake Sedge	NSE	S5	C					✓		
	Carex meadii	**Mead's Sedge**	**NSE**	**S2**	**R**		✓					✓
	Carex molesta	Troublesome Sedge	NSE	S4S5	U	✓						
	Carex muehlenbergii	**Muhlenberg's Sedge**	**NSE**	**S4S5**	**R**	✓						
	Carex normalis	**Greater Straw Sedge**	**NSE**	**S4**	**R**	✓						
	Carex pallescens	**Pale Sedge**	**iNaturalist**	**S4**	**R**							✓
	Carex radiata	Star Sedge	NSE	S5	C				✓			
	Carex rosea	Rosy Sedge	NSE	S5	C				✓			
	Carex sparganioides	Bur-reed Sedge	NSE	S5	U				✓			
	Carex spicata	Spiked Sedge	NSE	SE5	IC	✓	✓					
	Carex swanii	**Swan's Sedge**	**NSE**	**S4**	**R**		✓					
	Carex umbellata	**Parasol Sedge**	**NSE**	**S5**	**R**		✓					
	Carex vulpinoidea	Fox Sedge	NSE	S5	C	✓				✓		✓
	Schoenoplectus tabernaemontani	Soft-stemmed Bulrush	NSE	S5	C	✓				✓		
	Scirpus atrovirens	Dark Green Bulrush	NSE	S5	C	✓				✓		
	Scirpus microcarpus	**Small-headed Bulrush**	**iNaturalist**	**S5**	**R**					✓		
	Scirpus pendulus	Nodding Bulrush	NSE	S5	C	✓				✓		
Dipsacaceae	*Dipsacus fullonum*	Fuller's Teasel	NSE	SE5	IC	✓						
Dryopteridaceae	*Dryopteris carthusiana*	Spinulose Wood Fern	NSE	S5	C				✓			
	Dryopteris intermedia	Intermediate Wood Fern	NSE	S5	C				✓			
	Polystichum acrostichoides	Christmas Fern	NSE	S5	X				✓			
Elaeagnaceae	*Elaeagnus umbellata*	Autumn Olive	NSE	SE5	IR	✓	✓					
Equisetaceae	*Equisetum arvense*	Field Horsetail	NSE	S5	C	✓						
	Equisetum fluviatile	River Horsetail	iNaturalist	S5	U					✓		
	Equisetum hyemale	Rough Horsetail	NSE	S5	C	✓						
Fabaceae	*Desmodium canadense*	Showy Tick-trefoil	NSE	S4	X	✓						✓
	Desmodium perplexum	Perplexed Tick-trefoil	NSE	S4	X		✓					✓
	Lathyrus latifolius	Broad-leaved Sweet Pea	NSE	SE5	IX	✓	✓					
	Lotus corniculatus	Bird's-foot Trefoil	NSE	SE5	IX	✓						
	Medicago lupulina	Black Medick	NSE	SE5	IC	✓						
	Medicago sativa	Alfalfa	NSE	SE5	IC	✓						
	Melilotus albus	White Sweet-clover	NSE	SE5	IC	✓						
	Trifolium pratense	Red Clover	NSE	SE5	IX	✓	✓					
	Trifolium repens	White Clover	NSE	SE5	IX	✓						
	Vicia cracca	Cow Vetch	NSE	SE5	IX	✓						
Fagaceae	*Fagus grandifolia*	American Beech	NSE	S5	C				✓			
	Quercus alba	White Oak	NSE	S5	C				✓			
	Quercus macrocarpa	Bur Oak	NSE	S5	C	✓			✓			
	Quercus rubra	Northern Red Oak	NSE	S5	C				✓			
Geraniaceae	*Geranium maculatum*	Spotted Geranium	NSE	S5	X				✓			

Family	Scientific Name	Common Name	Source[1]	SRank[2]	RRank[3]	Vegetation Community						
						CUM	CUT	CUW	FOD	MAM	SWT	TPO
	Geranium robertianum	Herb-Robert	NSE	S5	C		✓	✓	✓			
Grossulariaceae	*Ribes americanum*	American Black Currant	NSE	S5	C				✓	✓	✓	
	Ribes cynosbati	Prickly Gooseberry	NSE	S5	C				✓			
Hypericaceae	*Hypericum perforatum*	Common St. John's-wort	NSE	SE5	IC	✓			✓			✓
Iridaceae	*Iris pseudacorus*	Yellow Iris	NSE	SE4	IR					✓		
	Iris versicolor	Northern Blueflag	NSE	S5	X					✓		
	Sisyrinchium angustifolium	**Narrow-leaved Blue-eyed-grass**	**NSE**	**S4**	**R**	✓						
	Sisyrinchium montanum	Strict Blue-eyed-grass	NSE	S5	X	✓						
Juglandaceae	*Carya cordiformis*	Bitternut Hickory	NSE	S5	X			✓	✓			
Juncaceae	***Juncus articulatus***	**Jointed Rush**	**iNaturalist**	**S5**	**R**	✓						
	Juncus dudleyi	Dudley's Rush	NSE	S5	C	✓						
	Juncus tenuis	Path Rush	NSE	S5	X	✓	✓	✓	✓			
	Juncus torreyi	Torrey's Rush	NSE	S5	U	✓						
	Luzula multiflora	Heath Woodrush	iNaturalist	S5	X				✓			
Lamiaceae	*Clinopodium vulgare*	Wild Basil	NSE	S5	X				✓			
	Leonurus cardiaca	Common Motherwort	NSE	SE5	IC	✓	✓	✓	✓			
	Lycopus americanus	American Bugleweed	NSE	S5	C				✓	✓		
	Monarda fistulosa	Wild Bergamot	NSE	S5	C	✓						✓
	Prunella vulgaris	Self-heal	NSE	S5	C	✓			✓			✓
	Scutellaria lateriflora	Side-flowering Skullcap	NSE	S5	X				✓	✓		
Liliaceae	*Erythronium americanum*	Yellow Trout-lily	NSE	S5	X				✓			
Lythraceae	*Lythrum salicaria*	Purple Loosestrife	NSE	SE5	IC	✓				✓	✓	
Malvaceae	*Tilia americana*	Basswood	NSE	S5	C				✓			
Melanthiaceae	*Trillium grandiflorum*	White Trillium	NSE	S5	X				✓			
Menispermaceae	*Menispermum canadense*	Canada Moonseed	NSE	S4	X				✓			
Mniaceae	*Plagiomnium ciliare*	Wavy-leaved Moss	NSE	S5					✓			
Montiaceae	*Claytonia virginica*	Virginia Spring Beauty	NSE	S5	C				✓			
Oleaceae	*Fraxinus americana*	White Ash	NSE	S4	C		✓	✓	✓			
	Fraxinus pennsylvanica	Green Ash	NSE	S4	C		✓	✓	✓			
	Ligustrum vulgare	Common Privet	NSE	SE5	IX		✓					
Onagraceae	*Circaea canadensis*	Broad-leaved Enchanter's-nightshade	NSE	S5	X			✓	✓			
	Oenothera parviflora	Northern Evening-primrose	NSE	S5	X	✓						✓
Onocleaceae	*Onoclea sensibilis*	Sensitive Fern	NSE	S5	X				✓		✓	
Orchidaceae	*Cypripedium parviflorum*	Yellow Lady's-slipper	NSE	S5	X		✓				✓	✓
	Epipactis helleborine	Helleborine Orchid	NSE	SE5	IX		✓	✓	✓			
	Liparis loeselii	Fen Orchid	NSE	S4S5	X	✓						
	Spiranthes incurva	Sphinx Ladies'-tresses	NSE	S5	X							✓
Orobanchaceae	***Aphyllon uniflorum***	**One-flowered Cancer-root**	**NSE**	**S4**	**R**				✓			
Oxalidaceae	*Oxalis stricta*	Upright Wood-sorrel	NSE	S5	X	✓						
Papaveraceae	*Sanguinaria canadensis*	Bloodroot	NSE	S5	X				✓			
Pinaceae	*Pinus strobus*	Eastern White Pine	NSE	S5	X	✓						
Plantaginaceae	*Chelone glabra*	White Turtlehead	NSE	S5	X					✓	✓	

Family	Scientific Name	Common Name	Source[1]	SRank[2]	RRank[3]	Vegetation Community						
						CUM	CUT	CUW	FOD	MAM	SWT	TPO
	Penstemon digitalis	Foxglove Beardtongue	NSE	S4	X	✓						✓
	Plantago lanceolata	English Plantain	NSE	SE5	IC	✓						
	Plantago major	Common Plantain	NSE	SE5	IC	✓			✓			
	Veronica anagallis-aquatica	Water Speedwell	NSE	SE	IX					✓	✓	
	Veronica officinalis	Heath Speedwell	NSE	SE5	IX				✓			
	Veronica serpyllifolia	Thyme-leaved Speedwell	NSE	SE5?	IX				✓			
Poaceae	*Agrostis gigantea*	Redtop Bentgrass	NSE	SE5	IC	✓				✓		
	Agrostis stolonifera	Creeping Bentgrass	NSE	SE5	IC	✓						
	Andropogon gerardii	Big Bluestem	NSE	S4	C	✓						✓
	Bromus inermis	Smooth Brome	NSE	SE5	IC	✓						
	Dactylis glomerata	Orchard Grass	NSE	SE5	IC	✓		✓	✓			
	Danthonia spicata	Poverty Oatgrass	NSE	S5	X	✓						✓
	Dichanthelium implicatum	Hairy Panic Grass	NSE	S5	X	✓						✓
	Elymus virginicus	Virginia Wild Rye	NSE	S5	X				✓			
	Festuca rubra	Red Fescue	NSE	S5	IX	✓						
	Glyceria striata	Fowl Manna Grass	NSE	S5	X	✓			✓	✓		
	Leersia virginica	Virginia Cutgrass	NSE	S5	X				✓			
	Lolium arundinaceum	Tall Fescue	NSE	SE5	IC	✓						
	Muhlenbergia schreberi	Nimblewill	NSE	S4	X				✓			
	Phalaris arundinacea	Reed Canary Grass	NSE	S5	X	✓				✓		
	Phleum pratense	Timothy	NSE	SE5	IC	✓						
	Poa compressa	Flattened Bluegrass	NSE	SE5	IX	✓						
	Poa pratensis	Kentucky Bluegrass	NSE	SE5	IC	✓						
	Schizachyrium scoparium	Little Bluestem	NSE	S4	X	✓						✓
	Sorghastrum nutans	Indian Grass	NSE	S4	X	✓						✓
Polygonaceae	*Persicaria maculosa*	Lady's-thumb	NSE	SE5	IX				✓	✓	✓	
	Persicaria virginiana	Jumpseed	NSE	S4	X				✓			
	Polygonum aviculare	Prostrate Knotweed	NSE	SE5	IC	✓						
	Rumex crispus	Curled Dock	NSE	SE5	IC	✓				✓		
Primulaceae	*Lysimachia ciliata*	Fringed Loosestrife	NSE	S5	X				✓	✓	✓	
	Lysimachia nummularia	Creeping Jenny	NSE	SE5	IX				✓			
Ranunculaceae	*Anemone virginiana*	Tall Thimbleweed	NSE	S5	C	✓			✓			✓
	Caltha palustris	Marsh Marigold	NSE	S5	C					✓	✓	
	Clematis virginiana	Virgin's-bower	NSE	S5	C	✓					✓	
	Ranunculus acris	Field Buttercup	NSE	SE5	IC	✓						
Rhamnaceae	*Frangula alnus*	Glossy Buckthorn	NSE	SE5	IU	✓	✓	✓	✓		✓	✓
	Rhamnus cathartica	Common Buckthorn	NSE	SE5	IC	✓	✓	✓	✓			✓
Rosaceae	*Agrimonia gryposepala*	Common Agrimony	NSE	S5	C				✓			
	Amelanchier arborea	Downy Serviceberry	iNaturalist	S5	C				✓			
	Crataegus crus-galli	**Cockspur Hawthorn**	**iNaturalist**	**S4**	**R**	✓	✓					✓
	Crataegus sp.	Unidentified Hawthorn	NSE			✓	✓	✓	✓			✓
	Fragaria vesca	Woodland Strawberry	NSE	S5	X				✓			
	Fragaria virginiana	Field Strawberry	NSE	S5	C	✓	✓	✓	✓			

Family	Scientific Name	Common Name	Source[1]	SRank[2]	RRank[3]	Vegetation Community						
						CUM	CUT	CUW	FOD	MAM	SWT	TPO
	Geum canadense	White Avens	NSE	S5	X				✓			
	Geum triflorum	**Prairie Smoke**	**NSE**	**S4**	**R**	✓						
	Geum urbanum	Wood Avens	NSE	SE3	IR				✓			
	Malus coronaria	Sweet Crabapple	NSE	S4	X		✓	✓				
	Malus pumila	Common Apple	iNaturalist	SE4	IX		✓					
	Potentilla recta	Sulphur Cinquefoil	NSE	SE5	IX	✓						
	Prunus virginiana	Choke Cherry	NSE	S5	C	✓	✓	✓	✓	✓	✓	
	Rosa multiflora	Multiflora Rose	NSE	SE5	IX	✓						
	Rubus allegheniensis	Allegheny Blackberry	NSE	S5	C	✓						
	Rubus idaeus ssp. strigosus	American Red Raspberry	NSE	S5	X	✓						
	Rubus occidentalis	Black Raspberry	NSE	S5	C	✓						
	Rubus setosus	**Bristly Blackberry**	**NSE**	**S4**	**R**	✓						
Rubiaceae	*Galium album*	White Hedge Bedstraw	NSE	SE5	IX	✓						
	Galium aparine	Catchweed Bedstraw	NSE	S5	X	✓						
	Galium boreale	Northern Bedstraw	iNaturalist	S5	X				✓			
	Galium palustre	Marsh Bedstraw	NSE	S5	X					✓	✓	
Salicaceae	*Populus balsamifera*	Balsam Poplar	NSE	S5	X	✓						
	Populus deltoides	Eastern Cottonwood	NSE	S5	X	✓			✓			
	Populus tremuloides	Trembling Aspen	NSE	S5	X	✓			✓			
	Salix alba	White Willow	NSE	SE5	IX				✓		✓	
	Salix amygdaloides	Peach-leaved Willow	NSE	S5	X						✓	
	Salix discolor	American Pussy Willow	NSE	S5	X	✓					✓	
	Salix eriocephala	Heart-leaved Willow	NSE	S5	X	✓					✓	
	Salix purpurea	Purple Willow	NSE	SE4	IX	✓						
Sapindaceae	*Acer x freemanii*	Freeman's Maple	NSE	SNA	hyb				✓			
	Acer saccharum	Sugar Maple	NSE	S5	C				✓			
Solanaceae	*Physalis heterophylla*	Clammy Ground-cherry	NSE	S4	X	✓						✓
	Solanum dulcamara	Bittersweet Nightshade	NSE	SE5	IC					✓	✓	
	Solanum emulans	Eastern Black Nightshade	NSE	S5	X	✓			✓			
Thuidiaceae	*Thuidium recognitum*	Hook-leaved Fern Moss	NSE	S5					✓			
Ulmaceae	*Celtis occidentalis*	Northern Hackberry	NSE	S4	X				✓			
	Ulmus americana	American Elm	NSE	S5	C				✓			
Urticaceae	*Boehmeria cylindrica*	False Nettle	NSE	S5	X				✓	✓	✓	
	Pilea pumila	Common Clearweed	NSE	S5	X				✓			
	Urtica dioica	Stinging Nettle	iNaturalist	S5	C					✓		
Verbenaceae	*Verbena hastata*	Blue Vervain	NSE	S5	C	✓				✓		
	Verbena urticifolia	White Vervain	NSE	S5	X				✓			
Violaceae	*Viola pubescens*	Downy Yellow Violet	NSE	S5	C				✓			
	Viola sororia	Common Blue Violet	NSE	S5	X				✓			
	Viola sp.	Unidentified Violet	iNaturalist						✓			
Vitaceae	*Parthenocissus inserta*	Thicket Creeper	NSE	S5	X	✓	✓	✓	✓			
	Parthenocissus quinquefolia	Virginia Creeper	NSE	S5	X				✓			
	Vitis riparia	Riverbank Grape	NSE	S5	C	✓	✓	✓	✓			✓

[1]Source: NSE – Observed by NSE during field investigations; iNaturalist – submitted to iNaturalist by other naturalists.
[2]Provincial conservation status: S5 – Secure; S4 – Apparently Secure; S2S3 – Imperiled to Vulnerable; S2 – Imperiled; SE – Exotic (number denotes abundance in Ontario); SNA – Not applicable (generally refers to hybrids).
[3]Regional conservation status (Middlesex County): C – Common; U – Uncommon; R – Rare; X – Data deficient; I – Introduced (suffix denotes abundance in Middlesex); hyb – Hybrid (not typically ranked).

Table 2.2 – Bird species observed in Kelly Stanton E.S.A.

Scientific Name	Common Name	Source[1]	S.A.R.A.[2]	E.S.A.[3]	SRank[4]	RRank[5]	Breeding Evidence
Accipiter cooperii	Cooper's Hawk	NSE	NAR	NAR	S4	L3	Observed
Actitis macularius	Spotted Sandpiper	NSE			S5	L3	Observed
Agelaius phoeniceus	Red-winged Blackbird	NSE			S4		Probable
Aix sponsa	Wood Duck	NSE			S5	L4	Possible
Ammodramus savannarum	Grasshopper Sparrow	NSE	SC	SC	S4B	L3	Probable
Anas platyrhynchos	Mallard	NSE			S5		Possible
Archilochus colubris	Ruby-throated Hummingbird	eBird			S5B	L2	Possible
Ardea herodias	Great Blue Heron	NSE			S4		Possible
Bombycilla cedrorum	Cedar Waxwing	NSE			S5B		Possible
Branta canadensis	Canada Goose	NSE			S5		Possible
Buteo jamaicensis	Red-tailed Hawk	NSE	NAR	NAR	S5		Possible
Cardinalis cardinalis	Northern Cardinal	NSE			S5		Probable
Cathartes aura	Turkey Vulture	NSE			S5B	L3	Possible
Catharus guttatus	Hermit Thrush	NSE			S5B		Observed
Chaetura pelagica	Chimney Swift	eBird	THR	THR	S4B,S4N		Observed
Charadrius vociferus	Killdeer	NSE			S5B,S5N		Possible
Cistothorus platensis	Sedge Wren	eBird	NAR	NAR	S4B	L2	Possible
Coccyzus erythropthalmus	Black-billed Cuckoo	NSE			S5B	L2	Probable
Colaptes auratus	Northern Flicker	NSE			S4B		Probable
Columba livia	Rock Pigeon	NSE			SNA		Possible
Contopus cooperi	Olive-sided Flycatcher	eBird	SC	SC	S4B		Observed
Contopus virens	Eastern Wood-pewee	NSE	SC	SC	S4B		Probable
Corvus brachyrhynchos	American Crow	NSE			S5B		Possible
Cyanocitta cristata	Blue Jay	NSE			S5		Probable
Dolichonyx oryzivorus	Bobolink	NSE	THR	THR	S4B	L2	Possible
Dumetella carolinensis	Gray Catbird	NSE			S4B	L4	Confirmed
Empidonax alnorum	Alder Flycatcher	eBird			S5B	L3	Observed
Empidonax minimus	Least Flycatcher	NSE			S4B	L3	Probable
Empidonax traillii	Willow Flycatcher	NSE			S5B		Probable
Eremophila alpestris	Horned Lark	NSE			S5B	L3	Observed
Euphagus carolinus	Rusty Blackbird	eBird	SC	SC	S4B		Observed
Falco sparverius	American Kestrel	NSE			S4	L2	Possible
Gavia immer	Common Loon	NSE	NAR		S5B,S5N		Observed
Geothlypis trichas	Common Yellowthroat	NSE			S5B		Probable

Scientific Name	Common Name	Source[1]	S.A.R.A[2]	E.S.A.[3]	SRank[4]	RRank[5]	Breeding Evidence
Grus canadensis	Sandhill Crane	NSE	NAR		S5B		Observed
Haemorhous mexicanus	House Finch	NSE			SNA		Possible
Hirundo rustica	Barn Swallow	NSE	THR	THR	S4B	L3	Observed
Icterus galbula	Baltimore Oriole	NSE			S4B		Probable
Junco hyemalis	Dark-eyed Junco	NSE			S5B		Observed
Lanius borealis	Northern Shrike	NSE			SNA		Observed
Larus delawarensis	Ring-billed Gull	NSE			S5B,S4N		Observed
Megaceryle alcyon	Belted Kingfisher	NSE			S4B		Possible
Melanerpes carolinus	Red-bellied Woodpecker	NSE			S4	L1	Probable
Meleagris gallopavo	Wild Turkey	NSE			S5		Probable
Melospiza georgiana	Swamp Sparrow	NSE			S5B	L2	Probable
Molothrus ater	Brown-headed Cowbird	NSE			S4B		Probable
Myiarchus crinitus	Great Crested Flycatcher	NSE			S4B		Probable
Oreothlypis ruficapilla	Nashville Warbler	eBird			S5B	L2	Possible
Pandion haliaetus	Osprey	NSE			S5B		Observed
Passerculus sandwichensis	Savannah Sparrow	NSE			S4B	L1	Confirmed
Passerina cyanea	Indigo Bunting	NSE			S4B		Probable
Phalacrocorax auritus	Double-crested Cormorant	eBird	NAR	NAR	S5B		Observed
Pheucticus ludovicianus	Rose-breasted Grosbeak	NSE			S4B		Probable
Picoides pubescens	Downy Woodpecker	NSE			S5		Probable
Picoides villosus	Hairy Woodpecker	NSE			S5		Probable
Pipilo erythrophthalmus	Eastern Towhee	NSE			S4B	L2	Confirmed
Piranga olivacea	Scarlet Tanager	eBird			S4B	L2	Possible
Poecile atricapillus	Black-capped Chickadee	NSE			S5	L4	Probable
Polioptila caerulea	Blue-gray Gnatcatcher	NSE			S4B	L4	Possible
Progne subis	Purple Martin	eBird			S4B	L2	Observed
Quiscalus quiscula	Common Grackle	NSE			S5B		Possible
Regulus calendula	Ruby-crowned Kinglet	NSE			S4B	L4	Observed
Regulus satrapa	Golden-crowned Kinglet	NSE			S5B	L3	Observed
Sayornis phoebe	Eastern Phoebe	NSE			S5B	L3	Probable
Scolopax minor	American Woodcock	NSE			S4B	L4	Confirmed
Seiurus aurocapilla	Ovenbird	eBird			S4B	L4	Probable
Setophaga petechia	Yellow Warbler	NSE			S5B		Probable
Setophaga ruticilla	American Redstart	NSE			S5B	L2	Probable
Sitta carolinensis	White-breasted Nuthatch	NSE			S5		Probable
Sphyrapicus varius	Yellow-bellied Sapsucker	eBird			S5B	L2	Possible
Spinus tristis	American Goldfinch	NSE			S5B	L3	Probable
Spizella arborea	American Tree Sparrow	NSE			S4B		Observed
Spizella pallida	Clay-colored Sparrow	eBird			S4B	L1	Possible
Spizella passerina	Chipping Sparrow	NSE			S5B		Probable
Spizella pusilla	Field Sparrow	NSE			S4B	L3	Confirmed
Stelgidopteryx serripennis	Northern Rough-winged Swallow	eBird			S4B	L2	Observed

Scientific Name	Common Name	Source[1]	S.A.R.A[2]	E.S.A.[3]	SRank[4]	RRank[5]	Breeding Evidence
Sturnella magna	Eastern Meadowlark	NSE	THR	THR	S4B	L2	Confirmed
Sturnus vulgaris	European Starling	NSE			SNA		Probable
Tachycineta bicolor	Tree Swallow	NSE			S4B		Possible
Toxostoma rufum	Brown Thrasher	NSE			S4B	L1	Probable
Tringa solitaria	Solitary Sandpiper	eBird			S4B		Observed
Troglodytes aedon	House Wren	NSE			S5B		Probable
Troglodytes hiemalis	Winter Wren	eBird			S5B	L4	Observed
Turdus migratorius	American Robin	NSE			S5B		Probable
Tyrannus tyrannus	Eastern Kingbird	NSE			S4B	L3	Probable
Vermivora cyanoptera	Blue-winged Warbler	NSE			S4B	L1	Possible
Vireo flavifrons	Yellow-throated Vireo	eBird			S4B	L3	Possible
Vireo gilvus	Warbling Vireo	NSE			S5B		Probable
Vireo olivaceus	Red-eyed Vireo	NSE			S5B		Probable
Vireo solitarius	Blue-headed Vireo	NSE			S5B	L3	Observed
Zenaida macroura	Mourning Dove	NSE			S5		Possible
Zonotrichia albicollis	White-throated Sparrow	NSE			S5B	L2	Observed

[1]Source: NSE – Observed by NSE during field investigations; eBird – submitted to eBird by other naturalists.
[2]Status under the S.A.R.A (2002): THR – Threatened; SC – Special Concern; NAR – Not at Risk.
[3]Status under the *Endangered Species Act* (2007): THR – Threatened; SC – Special Concern; NAR – Not at Risk.
[4]Provincial conservation status: S5 – Secure; S4 – Apparently Secure; S2S3 – Imperiled to Vulnerable; S2 – Imperiled; SE – Exotic (number denotes abundance in Ontario); SNA – Not applicable (generally refers to hybrids).
[5]Regional conservation status (Middlesex County) (Couturier, 1999): C – Common; U – Uncommon; R – Rare; X – Data deficient; I – Introduced (suffix denotes abundance in Middlesex); hyb – Hybrid (not typically ranked).

Table 2.3 – Mammal species observed in Kelly Stanton E.S.A.

Scientific Name	Common Name	Source[1]	S.A.R.A[2]	E.S.A.[3]	SRank[2]
Odocoileus virginianus	White-tailed Deer	NSE			S5
Procyon lotor	Common Raccoon	NSE			S5
Sciurus carolinensis	Eastern Gray Squirrel	NSE			S5
Tamias striatus	Eastern Chipmunk	NSE			S5

[1]Source: NSE – Observed by NSE during field investigations; iNaturalist – submitted to iNaturalist by other naturalists.
[2]Status under the S.A.R.A (2002): THR – Threatened; SC – Special Concern; NAR – Not at Risk.
[3]Status under the *Endangered Species Act* (2007): THR – Threatened; SC – Special Concern; NAR – Not at Risk.
[4]Provincial conservation status: S5 – Secure; S4 – Apparently Secure; S2S3 – Imperiled to Vulnerable; S2 – Imperiled; SE – Exotic (number denotes abundance in Ontario); SNA – Not applicable (generally refers to hybrids).

Table 2.4 – Reptiles and amphibians observed in Kelly Stanton E.S.A.

Scientific Name	Common Name	Source[1]	S.A.R.A[2]	E.S.A.[3]	S Rank[2]
Anaxyrus americanus	American Toad	NSE			S5
Chrysemys picta marginata	Midland Painted Turtle	iNaturalist			S4
Lampropeltis triangulum	Eastern Milksnake	iNaturalist	SC	NAR	S4
Lithobates pipiens	Northern Leopard Frog	NSE			S5
Pseudacris triseriata	Western Chorus Frog	NSE			S4
Storeria dekayi	DeKay's Brownsnake	NSE			S5
Thamnophis sirtalis sirtalis	Eastern Gartersnake	NSE			S5

[1]Source: NSE – Observed by NSE during field investigations; iNaturalist – submitted to iNaturalist by other naturalists.
[2]Status under the S.A.R.A (2002): THR – Threatened; SC – Special Concern; NAR – Not at Risk.
[3]Status under the *Endangered Species Act* (2007): THR – Threatened; SC – Special Concern; NAR – Not at Risk.
[4]Provincial conservation status: S5 – Secure; S4 – Apparently Secure; S2S3 – Imperiled to Vulnerable; S2 – Imperiled; SE – Exotic (number denotes abundance in Ontario); SNA – Not applicable (generally refers to hybrids).

Table 2.5 – All other wildlife observed in Kelly Stanton E.S.A.

Scientific Name	Common Name	Source[1]	S.A.R.A[2]	E.S.A.[3]	S Rank[2]
Argia fumipennis violacea	Violet Dancer	iNaturalist			S5
Calopteryx maculata	Ebony Jewelwing	iNaturalist			S5
Celithemis eponina	Halloween Pennant	iNaturalist			S4
Cercyonis pegala	Common Wood-Nymph	NSE			S5
Coenonympha tullia	Common Ringlet	iNaturalist			S5
Ctenucha virginica	Virginia Ctenucha	NSE			S5
Danaus plexippus	Monarch	NSE	END	SC	S2N,S4B
Epitheca cynosura	Common Baskettail	iNaturalist			S5
Euphydryas phaeton	Baltimore Checkerspot	iNaturalist			S4
Leucorrhinia intacta	Dot-tailed Whiteface	iNaturalist			S5
Libellula pulchella	Twelve-spotted Skimmer	iNaturalist			S5
Limenitis arthemis astyanax	Red-spotted Purple	iNaturalist			S5
Megisto cymela	Little Wood-Satyr	iNaturalist			S5
Papilio polyxenes	Black Swallowtail	iNaturalist			S5
Poanes hobomok	Hobomok Skipper	iNaturalist			S5

[1]Source: NSE – Observed by NSE during field investigations; iNaturalist – submitted to iNaturalist by other naturalists.
[2]Status under the S.A.R.A (2002): THR – Threatened; SC – Special Concern; NAR – Not at Risk.
[3]Status under the *Endangered Species Act* (2007): THR – Threatened; SC – Special Concern; NAR – Not at Risk.

APPENDIX 3 | Significant Wildlife Habitat Assessment

Table 3.1 – Significant Wildlife Habitat Assessment

Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H. Criteria	Presence in Kelly Stanton E.S.A.
		Ecosites	Criteria and Information Sources		
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 S.W.H. 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 (e.g., EHJV implementation plan) • 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 100-300 m 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) S.W.H. MIST Index #7 provides development effects and mitigation measures.	ABSENT – No suitable open fields containing spring sheet water are present in the E.S.A..
Waterfowl Stopover and Staging Areas (Aquatic) Rationale – Important for local and migrant waterfowl populations during the spring or fall migration or both periods	Canada Goose Cackling Goose Snow Goose American Black Duck Northern Pintail Northern Shoveler American Wigeon Gadwall	MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2	CRITERIA • Ponds, marshes, lakes, bays, coastal inlets and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as a S.W.H., however a reservoir managed as a large wetland or pond/lake does qualify	Studies carried out and verified presence of: • Aggregations of 100 or more of listed species for 7 days, results in >700 waterfowl use days • Areas with annual staging of ruddy ducks, canvasbacks, and redheads are S.W.H.	ABSENT – No suitable ponds, marshes or other aquatic stopover features are present in the E.S.A..

Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H. Criteria	Presence in Kelly Stanton E.S.A.
		Ecosites	Criteria and Information Sources		
combined. Sites identified are usually only one of a few in the eco-district.	Green-winged Teal Blue-winged Teal Hooded Merganser Common Merganser Lesser Scaup Greater Scaup Long-tailed Duck Surf Scoter White-winged Scoter Black Scoter Ring-necked duck Common Goldeneye Bufflehead Redhead Ruddy Duck Red-breasted Merganser Brant Canvasback Ruddy Duck	SWD3 SWD4 SWD5 SWD6 SWD7	• These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water). 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 (e.g., EHJV implementation plan) • Ducks Unlimited projects • Element occurrence specification by Nature Serve: http://www.natureserve.org • NHIC Waterfowl Concentration Area	• The combined area of the E.L.C. ecosites and a 100 m radius area is the S.W.H. • Wetland area and shorelines associated with sites identified within the S.W.H.TG Appendix K are significant wildlife habitat. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” • Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species numbers and dates recorded). S.W.H. 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 unvegetated shoreline habitats • Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October • Sewage treatment ponds and storm water ponds do not qualify as S.W.H.. INFORMATION SOURCES • Western hemisphere shorebird reserve network	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 (<24 hours) during spring migration, any site with >100 Whimbrel used for 3 years or more is significant. • The area of significant shorebird habitat includes the mapped E.L.C. shoreline ecosites plus a 100 m radius area • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”	ABSENT – No suitable shorelines or mudflats are present in the E.S.A..

Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H. Criteria	Presence in Kelly Stanton E.S.A.
		Ecosites	Criteria and Information Sources		
	Ruddy Turnstone Sanderling Dunlin		• Canadian Wildlife Service (CWS) Ontario Shorebird Survey • Bird Studies Canada • Ontario Nature • Local birders and naturalist clubs • NHIC Shorebird Migratory Concentration Area	S.W.H. MIST Index #8 provides development effects and mitigation measures.	
Raptor Wintering Area Rationale – Sites used by multiple species, a high number of individuals and used annually are most significant.	Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl SPECIAL CONCERN Short-eared Owl Bald Eagle	HAWKS/OWLS: Combination of E.L.C. Community Series; need to have present one Community Series from each land class; Forest: FOD, FOM, FOC. Upland: CUM, CUT, CUS, CUW. BALD EAGLE Forest Community Series: FOD, FOM, FOC, SWD, SWM or SWC on shoreline areas adjacent to large rivers or adjacent to lakes with open water (hunting area).	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 (>15 ha) 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 • 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” S.W.H. MIST Index #10 and #11 provides development effects and mitigation measures.	CANDIDATE – The E.S.A. itself is too small to be a significant raptor wintering area (<20 ha), but the surrounding landscape does provide a good mosaic of forest and open country habitats far larger than 20 ha. The E.S.A. may therefore form part of a significant raptor wintering area.
Bat Hibernacula	Big Brown Bat	Bat Hibernacula may be found in these ecosites: CCR1	CRITERIA	• All sites with confirmed hibernating bats are S.W.H.	ABSENT – No caves, mine shafts, underground foundations or other

Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H. Criteria	Presence in Kelly Stanton E.S.A.
		Ecosites	Criteria and Information Sources		
Rationale – Bat hibernacula are rare habitats in all Ontario landscapes.		CCR3 CCA1 CCA2 (Note: buildings are not considered S.W.H.)	• Hibernacula may be found in caves, mine shafts, underground foundations and Karsts • Active mine sites should not be considered as S.W.H. • The locations of Bat Hibernacula are relatively poorly known. INFORMATION SOURCES • OMNRF for possible locations and contact for local experts • NHIC Bat Hibernaculum • Ministry of Northern Development and Mines for location of mine shafts. • Clubs that explore caves (e.g., Sierra Club) University Biology Departments with bat experts.	• The area includes 200 m radius around the entrance of the hibernaculum for most development types and 1000 m for wind farms • Studies are to be conducted during the peak swarming period (August to September). Surveys should be conducted following methods outlined in the “Bats and Bat Habitats: Guidelines for Wind Power Projects” S.W.H. MIST Index #1 provides development effects and mitigation measures.	suitable structures are present in the E.S.A..
Bat Maternity Colonies Rationale – Known locations of forested bat maternity colonies are extremely rare in all Ontario landscapes.	Big Brown Bat Silver-haired Bat	Maternity colonies considered S.W.H. are found in forested Ecosites. All E.L.C. Ecosites in E.L.C. Community Series: FOD, FOM, SWD, SWM	CRITERIA • Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be S.W.H.). • Maternity roosts are not found in caves and mines in Ontario • Maternity colonies located in Mature deciduous or mixed forest stands with >10/ha large diameter (>25 cm diameter at breast height) 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	• 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 E.L.C. Ecosite or an Ecoelement containing the maternity colonies • Evaluation methods for maternity colonies should be conducted following methods outlined in the “Bats and Bat Habitats: Guidelines for Wind Power Projects” S.W.H. MIST Index #12 provides the development effects and mitigation measures.	CANDIDATE – A large number of dead ash trees in the south part of the E.S.A. may provide maternity habitat for Big Brown Bat and/or Silver-haired Bat and may occur at densities suitable for a maternity colony.

Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H. Criteria	Presence in Kelly Stanton E.S.A.
		Ecosites	Criteria and Information Sources		
			areas with at least 21 snags/ha are preferred INFORMATION SOURCES • OMNRF for possible locations and contact for local experts • University Biology Departments with bat experts.		
Turtle Wintering Areas Rationale – Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant.	SPECIAL CONCERN Midland Painted Turtle Northern Map Turtle Snapping Turtle	Snapping and Midland Painted Turtles: SW, MA, OA and SA; FEO and BOO. Northern Map Turtle: Open water areas such as deeper rivers or streams and lakes with current can also be used as overwintering habitat.	CRITERIA • For most turtles, wintering areas are in the same general areas as their core habitat. Water has to be deep enough not to freeze and have soft mud substrates. • Overwintering sites are permanent water bodies, large wetlands and bots or fens with adequate dissolved oxygen. • Manmade ponds such as sewage lagoons or storm water ponds should not be considered S.W.H.. INFORMATION SOURCES • EIS studies carried out by conservation authorities. • Field naturalist clubs. • OMNRF ecologist or biologist • NHIC	• Presence of five overwintering Midland Painted Turtles is significant. • One or more Northern Map Turtle or Snapping Turtle overwintering within a wetland is significant. • The mapped E.L.C. ecosite area with the overwintering turtles is the S.W.H.. If the hibernation site is within a stream or river, the deep-water pool where the turtles are overwintering is the S.W.H.. • Overwintering areas may be identified by searching for congregations (basking areas) of turtles on warm, sunny days during the fall (September to October) or spring (March to May). Congregation of turtles is more common where wintering areas are limited and therefore significant. S.W.H. MIST Index #28 provides development effects and mitigation measures for turtle wintering habitat.	ABSENT – No turtles have been observed in the E.S.A. and no large waterbodies or wetlands are present where turtles could overwinter below the frost line.
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	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.	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	Studies confirming: • Presence of snake hibernacula used by a minimum of five individuals of a snake species OR individuals of two or more snake species.	ABSENT – Snakes are present in the E.S.A., but no concentrations of snakes were observed that might suggest the presence of significant hibernacula.

Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H. Criteria	Presence in Kelly Stanton E.S.A.
		Ecosites	Criteria and Information Sources		
	Northern Ring-necked Snake Milksnake SPECIAL CONCERN Eastern Ribbonsnake	Observations or congregations of snakes on sunny warm days in the spring or fall is a good indicator.	abandoned crumbling foundations assist in identifying candidate S.W.H.. • Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line • Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover. 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 • NHIC	• Congregations of a minimum of five individuals of a snake species OR individuals of two or more snake spp. near potential hibernacula (e.g., foundation or rocky slope) on sunny warm days in Spring (April/May) and Fall (September/October) • NOTE: If there are Special Concern Species present, then site is S.W.H. • NOTE: Sites for hibernation possess specific habitat parameters (e.g. temperature, humidity, etc.) and consequently are used annually, often by many of the same individuals of a local population (i.e., strong hibernation site fidelity). Other critical life processes (e.g., mating) often take place in close proximity to hibernacula. • The feature in which the hibernacula is located plus a 30 m radius area is the S.W.H. S.W.H. MIS Index #13 provides development effects and mitigation measures for snake hibernacula.	
Colonially-Nesting Bird Breeding Habitat (Bank and Cliff) Rationale – Historical use and number of nests in a colony make this habitat significant. An identified colony can be very important to local populations. All swallow	Cliff Swallow Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies)	Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles Cliff faces, bridge abutments, silos, barns. Habitat found in the following ecosites: CUM1 CUT1 CUS1 BLO1 BLS1	CRITERIA • Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area. • Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles.	Studies confirming: • Presence of 1 or more nesting sites with 8 or more Cliff Swallow pairs and/or rough-winged swallow pairs during the breeding season. • A colony identified as S.W.H. will include a 50 m 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	ABSENT – There are no exposed banks, bluffs or cliffs in the E.S.A. which would be suitable nesting habitat.

Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H. Criteria	Presence in Kelly Stanton E.S.A.
		Ecosites	Criteria and Information Sources		
populations are declining in Ontario.		BLT1 CLO1 CLS1 CLT1	• Does not include a licensed/permitted Mineral Aggregate Operation. INFORMATION SOURCES • Reports and other information available from Conservation Authorities • Ontario Breeding Bird Atlas • Bird Studies Canada *NatureCounts* http://www.birdscanada.org/birdmon • Field naturalist clubs	and Bird Habitats: Guidelines for Wind Power Projects" S.W.H. MIST Index #4 provides development effects and mitigation measures.	
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). • NHIC Mixed Wader Nesting Colony • Aerial photographs can help identify large heronries. • Reports and other information available from Conservation Authorities. • MNRF District Offices • Field Naturalist Clubs.	Studies confirming: • Presence of 2 or more active nests of Great Blue Heron or other listed species. • The habitat extends from the edge of the colony and a minimum 300 m radius or extent of the Forest Ecosite containing the colony or any island <15 ha with a colony is the S.W.H. • Confirmation of active heronries are to be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the presence of fresh guano, dead young and/or eggshells S.W.H. MIST Index #5 provides development effects and mitigation measures.	ABSENT – No evidence of nesting has been observed for any of the indicator species in the E.S.A..
Colonially-Nesting Bird Breeding Habitat (Ground)	Herring Gull Great Black-backed Gull Little Gull	Any rocky island or peninsula (natural or artificial) within a lake or	CRITERIA • Nesting colonies of gulls and terns are on islands or peninsulas	Studies confirming: • Presence of >25 active nests for Herring Gulls or Ring-billed Gulls,	ABSENT – The E.S.A. does not contain rocky islands or peninsulas

Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H. Criteria	Presence in Kelly Stanton E.S.A.
		Ecosites	Criteria and Information Sources		
Rationale – Colonies are important to local bird populations, typically sites are only known colony in area and are used annually.	Ring-billed Gull Common Tern Caspian Tern Brewer's Blackbird	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	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. • NHIC Colonial Waterbird Nesting Area • MNRF District Offices. Field Naturalist Clubs	>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 150 m radius area of habitat, or the extent of the E.L.C. ecosites containing the colony or any island <3 ha with a colony is the S.W.H. • Studies would be done during May/June when actively nesting. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" S.W.H. MIST Index #6 provides development effects and mitigation measures.	which would be suitable for colonies of ground-nesting birds.
Migratory Butterfly Stopover Areas Rationale – Butterfly stopover areas are extremely rare habitats and are biologically important for butterfly species that migrate south for the winter.	Painted Lady Red Admiral SPECIAL CONCERN Monarch	Combination of E.L.C. Community Series; need to have present one Community Series from each landclass: Field: CUM, CUT, CUS Forest: FOC, FOD, FOM, CUP Anecdotally, a candidate site for butterfly stopover will have a history of butterflies being observed.	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 edge providing shelter are requirements for this habitat • Staging areas usually provide protection from the elements and are	Studies confirm: • The presence of Monarch Use Days (MUD) during fall migration (August/October). MUD is based on the number of days the site is used by Monarchs, multiplied by the number of individuals using the site. Numbers of butterflies can range from 100-500/day, significant variation can occur between years and multiple years of sampling should occur • Observational studies are to be completed and need to be done frequently during the migration period to estimate MUD. • MUD of >5000 or >3000 with the presence of Painted Ladies or Red	ABSENT – The E.S.A. is not located within 5 km of Lake Erie and is therefore not eligible to be a significant migratory butterfly stopover area.

Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H. Criteria	Presence in Kelly Stanton E.S.A.
		Ecosites	Criteria and Information Sources		
			often spits of land or areas with the shortest distance to cross the Great Lakes INFORMATION SOURCES • MNRF District Offices • NHIC • Agriculture Canada in Ottawa may have list of butterfly experts. • Field Naturalist Clubs • Toronto Entomologists Association	Admiral's is to be considered significant. S.W.H. 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 E.L.C. 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 S.W.H.. INFORMATION SOURCES • Bird Studies Canada • Ontario Nature • Local birders and field naturalist clubs	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 (March-May) and fall (August-October) migration using standardized assessment techniques. Evaluation to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • S.W.H. MIST Index #9 provides development effects and mitigation measures.	ABSENT – The E.S.A. is not located within 5 km of Lake Erie and is therefore not eligible to be a significant landbird migratory stopover area.

Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H. Criteria	Presence in Kelly Stanton E.S.A.
		Ecosites	Criteria and Information Sources		
			• 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 E.L.C. 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 (January/February) when >20 cm of snow is on the ground using aerial survey techniques, ground road surveys, or a pellet count deer survey S.W.H. MIST Index #2 provides development effects and mitigation measures	ABSENT – MNRF has not mapped any deer winter congregation areas in the E.S.A. or the surrounding area.
RARE VEGETATION COMMUNITIES					
Cliffs and Talus Slopes Rationale – Cliffs and Talus Slopes are extremely rare habitats in Ontario.		Any E.L.C. Ecosite within Community Series: TAO, TAS, TAT, CLO, CLS, CLT A Cliff is vertical to near vertical bedrock >3 m in height. A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris.	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 • NHIC has location information available on their website • Field Naturalist Clubs • Conservation Authorities	• Confirm any E.L.C. Vegetation Type for Cliffs or Talus Slopes S.W.H. MIST Index #21 provides development effects and mitigation measures	ABSENT – None of the listed Ecosites are present in the E.S.A..

Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H. Criteria	Presence in Kelly Stanton E.S.A.
		Ecosites	Criteria and Information Sources		
Sand Barren Rationale – Sand barrens are rare in Ontario and support rare species. Most sand barrens have been lost due to cottage development and forestry.		E.L.C. Ecosites: SBO1, SBS1, SBT1 Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always <60% Sand barrens typically are exposed sand, generally sparsely vegetated and caused by a lack of moisture, periodic fires and erosion. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered but less than 60%.	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 • NHIC has location information available on their website • Field Naturalist Clubs • Conservation Authorities	• Confirm any E.L.C. Vegetation Type for Sand Barrens • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic species) S.W.H. MIST Index #20 provides development effects and mitigation measures	ABSENT – None of the listed Ecosites are present in the E.S.A..
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 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	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) • Conserving Great Lakes Alvars (Ontario Nature) • OMNRF Districts • NHIC has location information available on their website • Field Naturalist Clubs • Conservation Authorities	• Field studies identify that four of the five alvar indicator species at a Candidate Alvar Site is significant • Site must not be dominated by exotic of introduced species (<50% vegetative cover are exotic species) • The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses S.W.H. MIST Index #17 provides development effects and mitigation measures	ABSENT – None of the listed Ecosites or indicator species are present in the E.S.A..

Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H. Criteria	Presence in Kelly Stanton E.S.A.
		Ecosites	Criteria and Information Sources		
		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			
Old Growth Forest Rationale – Due to historic logging practices and land clearance for agriculture, old growth forest is rare in Ecoregion 7E.		Forest Community Series: FOD, FOC, FOM, SWD, SWC, SWM Old Growth Forests are characterized by heavy mortality or turnover of over-storey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris.	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 S.W.H. • The forested area containing the old growth characteristics will have experienced no recognizable forestry activities (cut stumps will not be present) • The area of forest ecosites combined or an eco-element within an ecosite that contain the old growth characteristics is the S.W.H. • Determine E.L.C. vegetation types for the forest area containing the old growth characteristics S.W.H. MIST Index #23 provides development effects and mitigation measures	ABSENT – No trees estimated to be older than 140 years were identified in the E.S.A..
Savannah Rationale – Savannahs are extremely rare habitats in Ontario.		TPS1, TPS2, TPW1, TPW2, CUS2 A Savannah is a tallgrass prairie habitat that has	CRITERIA • No minimum size to site • Site must be restored or a natural site. Remnant sites such as railway	Field studies confirm: • One or more of the Savannah indicator species listed in Appendix N of the S.W.H.TG should be present. Note: savannah plant	ABSENT – None of the listed Ecosites are present in the E.S.A., but tallgrass woodland communities could be restored.

Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H. Criteria	Presence in Kelly Stanton E.S.A.
		Ecosites	Criteria and Information Sources		
		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).	right-of-ways are not considered S.W.H. INFORMATION SOURCES • NHIC has location information available on their website • Field Naturalist Clubs • Conservation Authorities	species list from Ecoregion 7E should be used. • Area of the E.L.C. Ecosite is the S.W.H. • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic species) S.W.H. MIST Index #18 provides development effects and mitigation measures.	
Tallgrass Prairie Rationale – Tallgrass prairies are extremely rare habitats in Ontario		TPO1, TPO2 A tallgrass prairie has ground cover dominated by prairie grasses. An open tallgrass prairie habitat has <25% tree cover. In Ecoregion 7E, known tallgrass prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario).	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 S.W.H. INFORMATION SOURCES • NHIC has location information available on their website • Field naturalist clubs • Conservation Authorities	Field studies confirm: • One or more of the Prairie indicator species listed in Appendix N of the S.W.H.TG should be present. Note: savannah plant species list from Ecoregion 7E should be used. • Area of the E.L.C. Ecosite is the S.W.H. • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic species) S.W.H. MIST Index #19 provides development effects and mitigation measures.	CONFIRMED – Tallgrass prairie communities are present throughout the north part of the E.S.A.. One indicator species listed in Appendix N of the S.W.H. Technical Guide (MNR, 2000) occurs in these communities: Mead's Sedge (*Carex meadii*).
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 S.W.H.TG (MNRF, 2000). Any E.L.C. Ecosite Code that has a possible E.L.C. Vegetation Type that is	CRITERIA • E.L.C. Ecosite codes that have the potential to be a rare E.L.C. Vegetation Type as outlined in Appendix M of the Significant Wildlife Habitat Technical Guide (MNRF, 2000).	• Field studies should confirm if an E.L.C. Vegetation Type is a rare vegetation community based on listing within Appendix M of the S.W.H.TG (MNRF, 2000). • Area of the E.L.C. Vegetation Type polygon is the S.W.H..	ABSENT – None of the vegetation communities assessed in the study area are classified as rare according to MNRF.

Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H. Criteria	Presence in Kelly Stanton E.S.A.
		Ecosites	**Criteria and Information Sources**		
		provincially rare is candidate S.W.H.. Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps.	• MNRF/NHIC will have up to date listing for rare vegetation communities. INFORMATION SOURCES • NHIC has location information available on their website • Field Naturalist Clubs • Conservation Authorities	S.W.H. MIST Index #37 provides development effects and mitigation measures.	
SPECIALIZED HABITAT FOR WILDLIFE					
Waterfowl Nesting Area Rationale – Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant	American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard	All upland habitats located adjacent to these wetland E.L.C. Ecosites are Candidate S.W.H.: MAS1, MAS2, MAS3, SAS1, SAM1, SAF1, MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SWT1, SWT2, SWD1, SWD2, SWD3, SWD4 Note: Includes adjacency to Provincially Significant Wetlands	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 120 m of each individual wetland where waterfowl nesting is known to occur • Upland areas should be at least 120 m wide so that predators such as raccoons, skunks and foxes have difficulty finding nests • Wood Ducks and Hooded Mergansers utilize large diameter trees (>40 cm diameter at breast height) in woodlands for cavity nest sites. INFORMATION SOURCES • Ducks Unlimited staff may know the locations of particularly productive nesting sites • MNRF Wetland Evaluations for indication of significant waterfowl nesting habitat • Reports and other information available from Conservation Authorities	Studies confirmed: • Presence of 3 or more nesting pairs for listed species excluding Mallards, OR presence of 10 or more nesting pairs for listed species including Mallards. • Any active nesting site of an American Black Duck is considered significant. • Nesting studies should be completed during the spring breeding season (April-June). Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” • A field study confirming waterfowl nesting habitat will determine boundary of the waterfowl nesting habitat for the S.W.H., this may be greater or less than 120 m from the wetland and will provide enough habitat for waterfowl to successfully nest S.W.H. MIST Index #25 provides development effects and mitigation measures.	ABSENT – No evidence of waterfowl breeding has been observed in the E.S.A..

Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H. Criteria	Presence in Kelly Stanton E.S.A.
		Ecosites	Criteria and Information Sources		
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	E.L.C. 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 S.W.H. (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 • Reports and other information available from Conservation Authorities. • Field naturalists clubs	Studies confirm the use of these nests by: • One or more active Osprey or Bald Eagle nests in an area • Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the S.W.H.. • For an Osprey, the active nest and a 300 m radius around the nest or the contiguous woodland stand is the S.W.H., maintaining undisturbed shorelines with large trees within this area is important • For a Bald Eagle the active nest and a 400-800 m radius around the nest is the S.W.H.. Area of the habitat from 400-800 m is dependent on sight lines from the nest to the development and inclusion of perching and foraging habitat • To be significant a site must be used annually. When found inactive, the site must be known to be inactive for >3 years or suspected of not being used for >5 years before being considered not significant. • Observational studies to determine nest site use, perching sites and foraging areas need to be done from early March to mid-August. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"	ABSENT – No Osprey or Bald Eagle nests have been documented in the E.S.A..

Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H. Criteria	Presence in Kelly Stanton E.S.A.
		Ecosites	Criteria and Information Sources		
				S.W.H. 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 E.L.C. 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 area of habitat is the S.W.H.. The 28 ha habitat area would be applied where optimal habitat is irregularly shaped around the nest. • Barred Owl – A 200m radius around the nest is the S.W.H. • Broad-winged Hawk and Coopers Hawk – A 100m radius around the nest is the S.W.H. • Sharp-Shinned Hawk – A 50 m radius around the nest is the S.W.H. • Conduct field investigations from early March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area. S.W.H. MIST Index #27 provides development effects and mitigation measures	ABSENT – No forest or swamp ecosites larger than 30 ha are present in the E.S.A. and no raptor nests have been documented.
Turtle Nesting Areas Rationale – These habitats are rare and when identified will often be the only breeding site for local populations of turtles.	SPECIAL CONCERN Midland Painted Turtle Northern Map Turtle Snapping Turtle	Exposed mineral soil (sand or gravel) areas adjacent (<100 m) or within the following E.L.C. Ecosites: MAS1, MAS2, MAS3, SAS1, SAM1, SAF1, BOO1, FEO1	CRITERIA • Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. • For an area to function as a turtle-nesting area, it must provide sand	Studies confirm: • Presence of 5 or more nesting Midland Painted Turtles. • One or more Northern Map Turtles or Snapping Turtles nesting is a S.W.H.. • The area or collection of sites within an area of exposed mineral	ABSENT – No turtles have been observed in the E.S.A..

Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H. Criteria	Presence in Kelly Stanton E.S.A.
		Ecosites	Criteria and Information Sources		
			and gravel that turtles are able to dig in and is located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not S.W.H.. • Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes and rivers are most frequently used. INFORMATION SOURCES • Use Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels). • Check the Ontario Herpetofaunal Summary Atlas records or other similar atlases for uncommon turtles; location information may help to find potential nesting habitat for them. • NHIC • Field naturalist clubs.	soils where the turtles nest, plus a radius of 30 to 100 m around the nesting area dependent on slope, riparian vegetation and adjacent land use is the S.W.H.. • Travel routes from wetland to nesting area are to be considered within the S.W.H. as part of the 30 to 100 m area of habitat. • Field investigations should be conducted in prime nesting season typically late spring to early summer. Observational studies observing the turtles nesting is a recommended method. S.W.H. MIST Index #28 provides development effects and mitigation measures for turtle nesting habitat.	
Seeps and Springs Rationale – Seeps/springs are typical of headwater areas and are often at the source of coldwater streams.	Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer Salamanders	Seeps and springs are areas where groundwater comes to the surface. Often, they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps and/or springs.	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 in the winter will support a variety of plant and animal species. INFORMATION SOURCES • Topographical Map. • Thermography.	Field studies confirm: • Presence of a site with 2 or more seeps and/or springs should be considered S.W.H.. • The area of an E.L.C. forest ecosite or an ecoelement within ecosite containing the seeps/springs is the S.W.H.. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation the habitat S.W.H. MIST Index #30 provides development effects and mitigation measures	ABSENT – No seeps or springs have been found in the E.S.A..

Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H. Criteria	Presence in Kelly Stanton E.S.A.
		Ecosites	Criteria and Information Sources		
			• Hydrological surveys conducted by Conservation Authorities and MECP. • Field Naturalists Clubs and landowners. • Municipalities and Conservation Authorities may have drainage maps and headwater areas mapped		
Amphibian Breeding Habitat (Woodland) Rationale – These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations.	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	All Ecosites associated with these E.L.C. Community Series: FOC, FOM, FOD, SWC, SWM, SWD Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians.	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 • CSW Amphibian Road Call Survey • Ontario Vernal Pool Association: http://www.ontariovernalpools.org	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog species with at least 20 individuals (adults or egg masses) or 2 or more of the listed frog species with Call Level Codes of 3. • A combination of observational study and call count surveys will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands • The habitat is the wetland area plus a 230 m radius of woodland area. If a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is to be included in the habitat. S.W.H. MIST Index #14 provides development effects and mitigation measures	CANDIDATE – Spring Peeper and Western Chorus Frog have been heard calling in the E.S.A. during the breeding season. However, formal call count surveys per the MMP protocol have not been conducted.
Amphibian Breeding Habitat (Wetland)	Eastern Newt American Toad Spotted Salamander	E.L.C. Community Classes SW, MA, FE, BO, OA and SA.	CRITERIA • Wetlands >500 m^2 (about 25 m diameter), supporting high species	Studies confirm: • Presence of breeding population of 1 or more of the listed	CANDIDATE – American Toad and Western Chorus Frog have been heard calling in the E.S.A. during the

Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H. Criteria	Presence in Kelly Stanton E.S.A.
		Ecosites	Criteria and Information Sources		
Rationale – Wetlands supporting breeding for these amphibian species are extremely important and fairly rare within central Ontario landscapes.	Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	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.	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) • CWS Amphibian Road Surveys and Backyard Amphibian Call Count. • OMNRF Districts and wetland evaluations. • Reports and other information available from Conservation Authorities	newt/salamander species OR 2 or more of the listed frog or toad species with at least 20 individuals (adults or eggs masses) OR 2 or more of the listed frog/toad species with Call Level Codes of 3 OR Wetland with confirmed breeding Bullfrogs are significant • The E.L.C. ecosite wetland area and the shoreline are the S.W.H. • A combination of observational study and call count surveys will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the wetlands. • If a S.W.H. is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. S.W.H. MIST Index #15 provides development effects and mitigation measures.	breeding season. However, formal call count surveys per the MMP protocol have not been conducted.
Woodland Area-Sensitive Bird Breeding Habitat Rationale – Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest songbirds.	Yellow-bellied Sapsucker Red-breasted Nuthatch Veery Blue-headed Vireo Northern Parula Black-throated Green Warbler Blackburnian Warbler Black-throated Blue Warbler Ovenbird Scarlet Tanager Winter Wren Pileated Woodpecker	All Ecosites associated with these E.L.C. Community Series: FOC, FOM, FOD, SWC, SWM, SWD	CRITERIA • Habitats where interior forest breeding birds are breeding, typically large mature (>60 years old) forest stands or woodlots >30 ha • Interior forest habitat is at least 200 m from forest edge habitat INFORMATION SOURCES • Local birder clubs. • CWS for the location of forest bird monitoring.	Studies confirm: • Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. • Note: any site with breeding Canada Warblers is to be considered S.W.H. • Conduct field investigations in spring and early summer when birds are singing and defending their territories	ABSENT – Interior forest is not present in the E.S.A..

Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H. Criteria	Presence in Kelly Stanton E.S.A.
		Ecosites	Criteria and Information Sources		
	SPECIAL CONCERN Canada Warbler		• 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" S.W.H. MIST Index #34 provides development effects and mitigation measures	
HABITAT FOR 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 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 • 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 S.W.H. • Area of the E.L.C. ecosite is the S.W.H.. • Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" S.W.H. MIST Index #35 provides development effects and mitigation measures	CANDIDATE – Sedge Wren has been observed in Kelly Stanton E.S.A. during the breeding season, but breeding has not been confirmed. It is unlikely that five or more breeding pairs of Sedge Wrens occur in the E.S.A.. No other indicator species have been observed.
Open Country Bird Breeding Habitat Rationale – This wildlife habitat is declining	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	ABSENT – Three indicator species are probable breeders in the E.S.A. (Grasshopper Sparrow, Vesper Sparrow, Savannah Sparrow), but nesting habitat is too small to be

Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H. Criteria	Presence in Kelly Stanton E.S.A.
		Ecosites	Criteria and Information Sources		
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	• A field with 1 or more breeding Short-eared Owls is to be considered S.W.H. • The area of S.W.H. is the contiguous E.L.C. ecosite field areas • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” S.W.H. MIST Index #32 provides development effects and mitigation measures	considered significant at a provincial level (<30 ha).
Shrub/Early Successional Bird Breeding Habitat Rationale – This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined significantly over the past 40 years based on CWS (2004) trend records.	INDICATOR SPECIES Brown Thrasher Clay-coloured Sparrow COMMON SPECIES Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher SPECIAL CONCERN 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	Field studies confirm: • Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species • A habitat with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat • The area of the S.W.H. is the contiguous E.L.C. ecosite field/thicket area. • Conduct field investigations of the most likely areas in spring and early summer when birds are	CONFIRMED – Both indicator species and all four common species of this S.W.H. type are probable breeders in the E.S.A.. When both blocks are looked at in combination, there is over 10 ha of early successional and shrub thicket habitats in the E.S.A..

Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H. Criteria	Presence in Kelly Stanton E.S.A.
		Ecosites	Criteria and Information Sources		
			• Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands INFORMATION SOURCES • Agricultural land classification maps, Ministry of Agriculture. • Local bird clubs. • Ontario Breeding Bird Atlas • Reports and other information available from Conservation Authorities	singing and defending their territories • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" S.W.H. 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 E.L.C. ecosite or an ecoelement area of meadow marsh or swamp within the larger ecosite area is the S.W.H. • Surveys should be done April to August in temporary or permanent water. Note the presence of burrows or chimneys are often the only indicator of presence, observance or collection of individuals is very difficult S.W.H. MIST Index #36 provides development effects and mitigation measures	CONFIRMED – Terrestrial crayfish burrows were found in the north part of the E.S.A..
Special Concern and Rare Wildlife Species Rationale – These species are quite rare or have experienced	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.	CRITERIA • When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or provincially Rare species; linking candidate	Studies confirm: • Assessment/inventory of the site for the identified special concern or rare species needs to be completed during the time of year	CONFIRMED – The following Special Concern and provincially rare species were observed in the study area:

Habitat Type	Wildlife Species	Candidate S.W.H.		Confirmed S.W.H. Criteria	Presence in Kelly Stanton E.S.A.
		Ecosites	Criteria and Information Sources		
significant population declines in Ontario.		Older EOs were recorded prior to GPS being available, therefore location information may lack accuracy.	habitat on the site needs to be completed to E.L.C. Ecosites INFORMATION SOURCES • NHIC will have Special Concern and 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 species. Have little information available about their requirements.	when the species is present or easily identifiable. • The area of the habitat to the finest E.L.C. scale that protects the habitat form and function is the S.W.H., this must be delineated through detailed field studies. The habitat needs be easily mapped and cover an important life stage component for a species (e.g., specific nesting habitat or foraging habitat). S.W.H. MIST Index #37 provides development effects and mitigation measures	• False Tomentose Balsam Ragwort • Mead's Sedge • Eastern Wood-pewee • Grasshopper Sparrow • Olive-sided Flycatcher • Rusty Blackbird • Eastern Milksnake • Monarch
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 S.W.H. (Amphibian Breeding Habitat, Wetland) INFORMATION SOURCES • MNRF District Office. • 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 200 m wide of woodland habitat and with gaps <20 m • Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat S.W.H. MIST Index #40 provides development effects and mitigation measures	CANDIDATE – There are probably local amphibian movement corridors between wetland and terrestrial communities in the E.S.A..

APPENDIX 4 | Restoration Overlays and Priorities by Polygon

Table 4.1 – Restoration overlays and priorities by polygon

Polygon #	Area (ha)	Vegetation Community	Invasive Species Cover (%)	S.A.R./S.W.H./Rare Species	Restoration Overlay	Restoration Target Community	Restoration Tasks	Priority	Volunteer Opportunities
1		CUM1	<5	Prairie Smoke	RO2a	Tallgrass Prairie	Consider conducting controlled burn Hand sow native prairie grasses and wildflowers Monitor vegetation composition Monitor for new invasive species occurrences	Medium	Yes
2		CUT1	<5	Shrub/Early-successional Bird Breeding Habitat, Swan's Sedge	RO2b	Tallgrass Prairie	Remove invasive buckthorn and other shrubs Hand sow native prairie grasses and wildflowers Monitor vegetation composition Monitor for new invasive species occurrences	Medium	Yes
3		TPO2-1/CUT1	5-25	Shrub/Early-successional Bird Breeding Habitat, Tallgrass Prairie, Mead's Sedge, Butterfly Milkweed, Cockspur Hawthorn, Pale Sedge	RO1b	Tallgrass Prairie	Remove encroaching shrubby vegetation Consider conducting controlled burn Monitor vegetation composition Monitor for new invasive species occurrences	High	Yes
4		CUT1	>25	Shrub/Early-successional Bird Breeding Habitat, Terrestrial Crayfish Habitat	RO2b	Tallgrass Prairie	Remove invasive buckthorn and other shrubs Hand sow native prairie grasses and wildflowers Monitor vegetation composition Monitor for new invasive species occurrences	Low	Yes
5		MAM2-10	>5	Terrestrial Crayfish Habitat	n/a	n/a	No specific restoration objectives.	n/a	n/a
6		CUT1	>25	Shrub/Early-successional Bird Breeding Habitat, Cockspur Hawthorn	RO2b	Tallgrass Prairie	Remove invasive buckthorn and other shrubs Hand sow native prairie grasses and wildflowers Monitor vegetation composition Monitor for new invasive species occurrences	Low	Yes
7		FOD7-3	>25	Terrestrial Crayfish Habitat	n/a	n/a	No specific restoration objectives.	n/a	n/a
8		CUM1	>25	Eastern Meadowlark, Bristly Blackberry, Greater Straw Sedge, Muhlenberg's Sedge	RO2a	Tallgrass Prairie	Consider conducting controlled burn Hand sow native prairie grasses and wildflowers Monitor vegetation composition	Medium	Yes

Polygon #	Area (ha)	Vegetation Community	Invasive Species Cover (%)	S.A.R./S.W.H./Rare Species	Restoration Overlay	Restoration Target Community	Restoration Tasks	Priority	Volunteer Opportunities
							Monitor for new invasive species occurrences		
9		SWT2	5-25	Terrestrial Crayfish Habitat	n/a	n/a	No specific restoration objectives.	n/a	n/a
10		TPO2-1	<5	Tallgrass Prairie, False Tomentose Balsam Ragwort	RO1a	Tallgrass Prairie	Monitor vegetation composition Monitor for new invasive species occurrences	High	Yes
11		CUT1	5-25	Shrub/Early-successional Bird Breeding Habitat,	RO2b	Tallgrass Prairie	Remove invasive buckthorn and other shrubs Hand sow native prairie grasses and wildflowers Monitor vegetation composition Monitor for new invasive species occurrences	Low	Yes
12		FOD8-1	>25	n/a	RO3	Deciduous Forest	Remove invasive buckthorn Monitor buckthorn cover and for new invasive species occurrences	Low	Yes
13		CUT1	5-25	Shrub/Early-successional Bird Breeding Habitat, Parasol Sedge	RO2b	Tallgrass Prairie	Remove invasive buckthorn and other shrubs Hand sow native prairie grasses and wildflowers Monitor vegetation composition Monitor for new invasive species occurrences	Low	Yes
14		FOD9-5	>25	Amphibian Breeding Habitat, One-flowered Cancer-root, Parasol Sedge	RO3	Deciduous Forest	Remove invasive buckthorn Monitor buckthorn cover and for new invasive species occurrences	Low	Yes
15		MAM2-2	<5	Marsh Bird Breeding Habitat (candidate), Small-headed Bulrush	n/a	n/a	No specific restoration objectives.	n/a	n/a
16		CUT1	>25	Shrub/Early-successional Bird Breeding Habitat,	RO2b	Tallgrass Prairie	Remove invasive buckthorn and other shrubs Hand sow native prairie grasses and wildflowers Monitor vegetation composition Monitor for new invasive species occurrences	Low	Yes
17		CUM1	5-25	Jointed Rush, Narrow-leaved Blue-eyed-grass	RO2a	Tallgrass Prairie	Consider conducting controlled burn Hand sow native prairie grasses and wildflowers Monitor vegetation composition	Medium	Yes

Polygon #	Area (ha)	Vegetation Community	Invasive Species Cover (%)	S.A.R./S.W.H./Rare Species	Restoration Overlay	Restoration Target Community	Restoration Tasks	Priority	Volunteer Opportunities
							Monitor for new invasive species occurrences		
18		CUT1	<5	Shrub/Early-successional Bird Breeding Habitat,	n/a	n/a	No specific restoration objectives.	n/a	n/a
19		CUT1	>25	Shrub/Early-successional Bird Breeding Habitat,	RO2b	Tallgrass Prairie	Remove invasive buckthorn and other shrubs Hand sow native prairie grasses and wildflowers Monitor vegetation composition Monitor for new invasive species occurrences	Low	Yes
20		TPO2-1	<5	Tallgrass Prairie	RO1a	Tallgrass Prairie	Monitor vegetation composition Monitor for new invasive species occurrences	Medium	Yes
21		FOD6-5	>25	Bat Maternity Colony (candidate)	RO3	Deciduous Forest	Remove invasive buckthorn Monitor buckthorn cover and for new invasive species occurrences	Medium	Yes
22		MAM2-2	<5	n/a	n/a	n/a	No specific restoration objectives.	n/a	n/a
23		CUW1/CUT1	>25	Shrub/Early-successional Bird Breeding Habitat, Bat Maternity Colony (candidate)	RO4b	Deciduous Forest	Remove invasive buckthorn Plant native trees Monitor buckthorn cover and for new invasive species occurrences	Low	Yes
24		CUM1	5-25	n/a	RO4a	Deciduous Forest	Plant native trees Monitor for new invasive species occurrences	Low	Yes