

CITY OF WINDSOR

NATURAL HERITAGE REVIEW REPORT

PROPOSED NATIONAL URBAN PARK IN WINDSOR

OJIBWAY PRAIRIE COMPLEX

JUNE 20, 2024





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PROJECT NO.: IM22104012

DATE: JUNE 20, 2024

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APPENDICES

Appendix A Field Survey Species Lists (Removed to protect sensitive information)
Appendix B Provincially Rare and Species at Risk Occurrences (Removed to protect sensitive information)
Appendix C Bat Activity Figures (Removed to protect sensitive information)
Appendix D Significant Wildlife Habitat Screening Document (Removed to protect sensitive information)
Appendix E Water Quality and Benthic Invertebrate Assessment
Appendix F Sources for Species Lists and Species Information for Ojibway Prairie Complex

1 INTRODUCTION

1.1 BACKGROUND

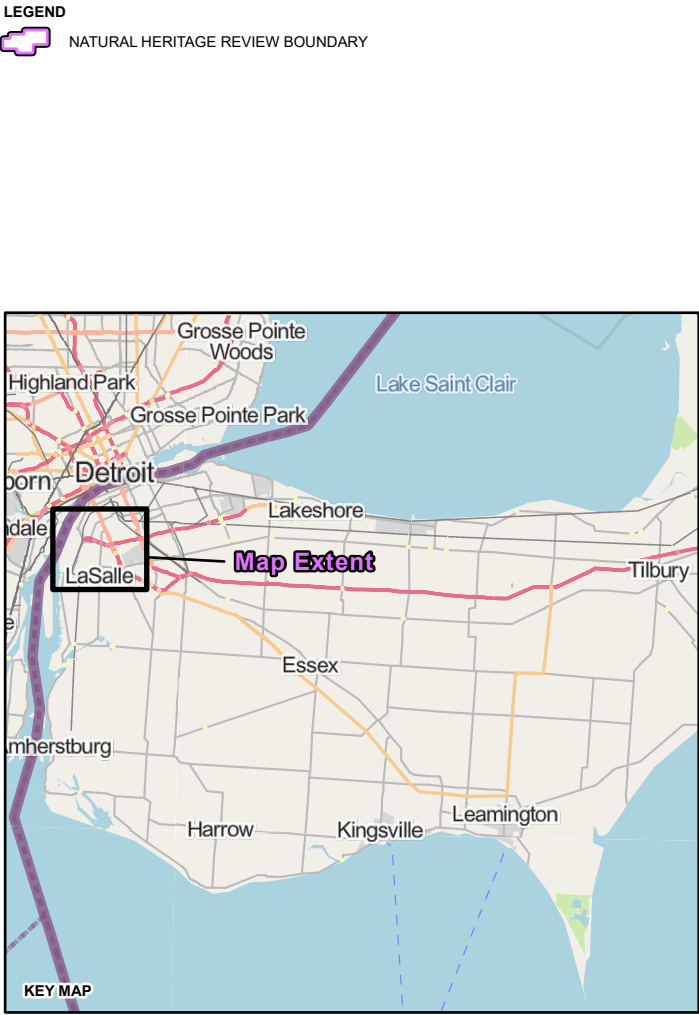
The City of Windsor (the City) retained WSP Environment and Infrastructure Canada Ltd. (WSP) to undertake a natural heritage assessment of 11 environmentally significant areas within the City in support of the Ojibway National Urban Park project (NUP). In August 2021, Parks Canada and the City signed a statement of collaboration to work together to advance the creation of a national urban park at the Ojibway Prairie Complex and potentially other surrounding natural areas. The Ojibway NUP project has recently completed the Pre-feasibility Assessment Phase, which included exploratory work to fully understand the natural and cultural values of the proposed NUP sites, their potential for restoration, conservation, and use, and to identify associated challenges and potential opportunities.

As part of the Pre-feasibility Assessment Phase, WSP undertook a scope of work to compile existing natural heritage information and fill knowledge gaps with respect to vegetation communities, flora and fauna, significant natural heritage features, significant wildlife habitat (SWH), and environmental policy, legislation, and regulations. This scope of work included the following components:

- Desktop screening and secondary source review of existing natural heritage studies, plans, lists and databases.
- Vegetation community composition and Ecological Land Classification (ELC) mapping.
- Amphibian call surveys and acoustic bat monitoring.
- Species composition of significant trees (>50 cm in diameter at breast height (DBH)).
- Presence of invasive plant species that have the potential to affect vegetation community quality and diversity.
- Incidental occurrences of species at risk (SAR); rare species and other wildlife.
- Evaluation of the significance of natural heritage features relative to natural heritage policy, regulations, and legislation.

The 11 natural areas subject to the natural heritage review include Black Oak Heritage Park Area, Ojibway Park Area, Tallgrass Prairie Heritage Park Area, Ojibway Prairie Provincial Nature Reserve Area, Spring Garden Natural Area, and Oakwood Natural Area, together comprising the Ojibway Prairie Complex along with adjacent privately-owned natural lands. The additional five sites represent ecologically important natural lands adjacent and near to the Complex, including Ojibway Shores, Malden Park, South Cameron Woodlot Area, Chappus Natural Area, and St. Clair College Prairie and Woods (Figure 1-1). These 11 natural areas total approximately 850 hectares (ha) for consideration in the proposed Ojibway NUP and include a diverse assemblage of vegetation communities, rare flora and fauna and

significant natural heritage features. The natural areas are currently under a variety of jurisdictions including municipal, provincial, federal, and private.



REFERENCE(S)
COUNTY OF ESSEX, IMAGERY SERVICE: COUNTY 2022 AIRPHOTO, COUNTY 2021 AIRPHOTOMAP DATA © OPENSTREETMAP CONTRIBUTORS, MICROSOFT, FACEBOOK, INC. AND ITS AFFILIATES, ESRI COMMUNITY MAPS CONTRIBUTORS, MAP LAYER BY ESRI, MAXAR. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO, CANADA.
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CLIENT

PROJECT
PROPOSED NATIONAL URBAN PARK IN WINDSOR
OJIBWAY PRAIRIE COMPLEX
NATURAL HERITAGE REVIEW REPORT

TITLE
PROJECT OVERVIEW

CONSULTANT	YYYY-MM-DD	2024-03-05
	DESIGNED	SS
	PREPARED	HB
	REVIEWED	
	APPROVED	



2 METHODS

2.1 DESKTOP SCREENING AND SECONDARY SOURCE REVIEW

Screening of available background information from existing studies, plans, databases, and other sources was completed. The desktop screening assisted in the preliminary determination of existing natural heritage features and candidate features, as well as other sensitivities and plant and wildlife species present within the natural areas. The data review included potential occurrences of species of conservation concern, including SAR and provincially rare species, and the presence of ANSI, Environmentally Sensitive Areas, Provincially Significant Wetlands (PSW), and other regulated areas located within and adjacent to the 11 natural areas.

A sample of relevant background queries, studies and reports include:

- Natural Heritage Information Centre (grids 17LG2681, 17LG2682, 17LG2781, 17LG2782, 17LG2881, 17LG2882, 17LG2979, 17LG2980, 17LG2981, 17LG3079, 17LG3082, 17LG3083, 17LG3180, 17LG3182, 17LG3183, 17LG3279, 17LG3280, 17LG3282)
- Ontario Nature Reptile and Amphibian Atlas (grids 17LG28, 17LG37, 17LG38)
- Ontario Breeding Bird Atlas (grids 17LG28, 17LG37, 17LG38)
- eBird Hotspots (Ojibway Prairie Complex (natural area + 500-meter (m) buffer)).
- Ontario Butterfly Atlas by the Toronto Entomologists' Association (grids 17LG28, 17LG37, 17LG38)
- Fisheries and Oceans Canada (online Aquatic Species at Risk Maps)
- Land Information Ontario (Aquatic Resource Area; Wooded Area)
- iNaturalist (natural area + 500 m buffer)
- Ojibway Prairie Complex Species Lists (<https://www.ojibway.ca/index.htm>)
- Mam mals of the Great Lakes Region (Kurta, 1995)
- Atlas of the Mam mals of Ontario (Dobbyn, 1994)
- Amphibians and Reptiles of the Great Lakes Region (Harding, 1997)
- The Physiography of Southern Ontario (Putnam & Chapman, 1984)
- Soil Survey of Essex County (Richards et al., 1949)
- Black Oak Heritage Park Management Plan (Sage Earth, 2019)
- Ojibway Shores Natural Heritage Inventory/Evaluation (Gardner-Costa et al., 2017)

2.2 VEGETATION COMMUNITY EVALUATION

2.2.1 ECOLOGICAL LAND CLASSIFICATION

Ecological Land Classification (ELC) vegetation communities were delineated using aerial photography and ground-truthing during field surveys conducted from June 2 through June 30, 2022, with follow-up surveys as necessary in July and August 2022. Field surveys were undertaken on public property only. Classifications were completed using The Ecological Land Classification for Southern Ontario: First Approximation and Its Application (Lee et al., 1998) in keeping with the standardized protocol and the Natural Heritage Information Centre's (NHIC) references to rare vegetation communities and specialized habitat for wildlife. That being said, the 1998 ELC manual was developed in communities not reminiscent of those seen in heavily agrarian landscapes today. An updated version of the "Vegetation Type List", which is more applicable to agrarian landscapes, was unofficially released in draft form in 2008 (Lee, 2008). Both versions use the same field survey methods. Where applicable, WSP has referenced the second approximation results (Lee, 2008) to provide a more accurate description, specifically of cultural and anthropogenic land uses in the natural areas.

The ELC methods include the description of substrate type and depth, moisture regime, the presence of mottles and gleys (i.e., spotted, or streaked areas of colour in soil that result from prolonged water saturation or poor aeration of the soil profile), topography, floral composition, stand structure and disturbance to classify vegetation communities. The terminology used was based on ELC sampling protocols that collect information on four vegetation layers (note: some layers may not be present within a vegetation community sampled). The four layers included:

Canopy consists of tall vegetation that reaches the light first, typically composed of tall trees (in a forest community).

Sub-canopy includes vegetation growing just under the canopy, vegetation that receives filtered sunlight through the canopy, typically composed of trees and tall shrubs (in a forest community).

Understory includes vegetation growing below the sub-canopy, typically composed of both tall and low-growing shrubs (in a forest community).

Ground layer consists of the vegetation which is closest to and covers the ground, typically composed of herbaceous vegetation.

ELC was also used to identify the presence of rare and/or sensitive vegetation communities and/or species to the extent possible. The occurrence of ELC communities was cross-referenced with provincially rare vegetation communities as identified in the Significant Wildlife Habitat Technical Guide (MNRF, 2022). Vegetation communities were also used to screen for SWH using the Significant Wildlife Habitat Criteria Schedule for Ecoregion 7E (MNRF, 2015).

Note that all species nomenclature follows the NHIC (2022). The species names contained in this report are referred to by the common English name. Scientific names are provided in the tables and appendices.

Plant species lists generated from ELC vegetation community mapping and during other field surveys conducted in the natural areas are provided in Appendix A.

2.2.2 VEGETATION COMMUNITY DIVERSITY

Areas may be considered diverse if they support many species and associations, and a heterogeneous physical structure. Areas of high diversity contain several types of natural communities and will often encompass a spectrum of topography, soil types, moisture regimes and vegetation structure (ERCA, 2010). Evaluation of a natural area's vegetation community diversity was completed utilizing the information obtained from ELC community mapping for the number of Community Series, Ecosites and Vegetation Types (Lee et al., 1998; Lee, 2008). The ranking system for vegetation community diversity was based on the criteria established and used by ERCA for their regional natural heritage evaluations in 2010.

For each natural area, the total number of ELC Vegetation Types in each Community Series was evaluated against the ranking system for vegetation community diversity described in Table 2-1.

Table 2-1: Vegetation Community Diversity Ranking System

Diversity Level	Criteria
Very High Diversity	Site contains >10 ELC Vegetation Types in 2 Community Series; OR had 3 or more Community Series documented on the site
High Diversity	Site contains 6 to 10 ELC Vegetation Types in 2 Community Series; OR >10 ELC Vegetation Types in one ELC Community Series
Diverse	Site contains at least 2 to 5 ELC Vegetation Types in 2 ELC Community Series; OR 6 to 10 ELC Vegetation Types in one ELC Community Series
Relatively Homogenous	Not a diverse site. Vegetation consists of 2 to 5 ELC Vegetation Types in one ELC Community Series
Homogenous	Not a diverse site. All of the vegetation is of the same ELC Vegetation Type and the same ELC Community Series

Notes: Criteria derived from ERCA, 2010.

2.2.3 RARE VEGETATION COMMUNITIES

Rare vegetation communities contain assemblages of plants and animals that depend on such habitats for their survival, and cannot readily move to, or find alternative habitats

(MNRF, 2022). Some of these communities, such as tallgrass prairies and savannahs, were never widespread in the province. Now these habitats and many of the species they support are rare or threatened due to intensive land use change (MNRF, 2022). Often, the main ecological function of these rare communities is just to ensure survival of the species that depend upon them.

To determine the presence of rare vegetation communities, ELC results were cross-referenced with the rarity rankings identified by the Ministry of Natural Resources and Forestry (MNRF, 2022). Any communities currently listed as S1 to S3 in the Provincial Rank system were considered a rare community. The Global Rank system was also cross-referenced, and significance was recorded. An explanation of the global and provincial rarity rankings is provided below.

Global Rank (GRank):

The Global rank system was developed by The Nature Conservancy (U.S.) and is now maintained by NatureServe in cooperation with Heritage Programs or Conservation Data Centers in all 50 states, 9 Canadian provinces, and in 13 Latin American countries. The global rank is known as GRank. The ranking is a 1-5 scale with 1 being critically imperiled and 5 being secure. When determining the rank, many factors are taken into consideration, including the number of known occurrences, threats, inherent sensitivity, area occupied, and other biological and anthropogenic factors. The global ranks are explained below:

G1: Critically imperiled globally. At very high risk of extinction or elimination due to very restricted range, very few populations or occurrences (5 or fewer occurrences or very few remaining hectares), very steep declines, very severe threats, or other factors.

G2: Imperiled globally. At high risk of extinction or elimination due to restricted range, few populations or occurrences (6 to 20 occurrences or few remaining hectares), steep declines, severe threats, or other factors.

G3: Vulnerable. Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range (e.g., a single province or physiographic region) or because of other factor(s) making it vulnerable to extinction throughout its range; in terms of occurrences, in the range of 21 to 100.

Vegetation communities assigned lower ranks, such as G4 and G5, are considered to be globally secure. A rank of G4 refers to a community which is apparently secure globally, while a rank of G5 indicates a community is demonstrably secure globally.

Provincial Rank (SRank):

The NHIC uses a ranking system that considers the provincial rank of an element (=species or community type) as a tool to prioritize protection efforts. These ranks are not legal designations. The provincial (=subnational) rank is known as SRank. These ranks have been assigned using the best available scientific information, and follow a systematic ranking procedure developed by The Nature Conservancy (U.S.). The ranks are based on the estimated number of occurrences, estimated community areal extent, and estimated range

of the community within the province (MNRF, 2022). The provincial ranks are explained below:

S1: Extremely rare in Ontario. Usually 5 or fewer occurrences in the province, or very few remaining hectares.

S2: Very rare in Ontario. Usually between 5 and 20 occurrences in the province, or few remaining hectares.

S3: Rare to uncommon in Ontario. Usually between 20 and 100 occurrences in the province; may have fewer occurrences, but with some extensive examples remaining.

Communities which are assigned lower ranks, such as S4 and S5, are considered to be common and widespread in Ontario. A rank of S4 denotes a community that is apparently secure in the province, with many occurrences, while S5 indicates it is demonstrably secure in the province.

2.2.4 RARE PLANT SPECIES AND SAR

The presence of rare plant species and SAR in the natural areas was determined through the review of historic and current NHIC records and site-specific reports and field surveys completed by others. In addition, plant species lists generated from ELC, follow-up vegetation surveys in July and August 2022 and incidental observations during other field studies were also cross-referenced with the rarity rankings provided by the NHIC. Rarity rankings for plant and wildlife species are defined in Table 2-2 below.

Table 2-2: Provincial Rank (S-Rank) Status Definitions for Rare Plant and Wildlife Species

Provincial Rank (SRank)	
SX	Presumed Extirpated; species or community is believed to be extirpated from the nation or state/province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.
SH	Possibly Extirpated (Historical); species or community occurred historically in the nation or state/province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years. A species or community could become NH or SH without such a 20-40 year delay if the only known occurrences in a nation or state/province were destroyed or if it had been extensively and unsuccessfully looked for. The NH or SH rank is reserved for species or communities for which some effort has been made to relocate occurrences, rather than simply using this status for all elements not known from verified extant occurrences.
S1	Critically Imperiled; critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
S2	Imperiled; imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.

Provincial Rank (SRank)	
S3	Vulnerable; vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
S4	Apparently Secure; uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5	Secure; common, widespread, and abundant in the nation or state/province.
SNR	Unranked; nation or state/province conservation status not yet assessed.
SU	Unrankable; currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
SNA	Not Applicable; a conservation status rank is not applicable because the species is not a suitable target for conservation activities.
S#S#:	Range Rank; a numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).

In the event a plant SAR was observed during any field investigations, the species name, relative abundance, digital photograph and UTM coordinates were recorded. Point and/or polygon locations were then cross-referenced with the results from the ELC vegetation community mapping.

Designations as they relate to SAR occur at the provincial and federal levels. Designations made by the MNR as of January 1995 are based on the recommendations of the Committee on the Status of Species at Risk in Ontario (COSSARO) and apply at the provincial level by regulation under the provincial Endangered Species Act (ESA). Federal designations are the work of the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and apply at the national level by regulation under the federal Species at Risk Act (SARA). Although the work of both these committees are integrated, there may be some differences between the provincial and national designations.

Definitions as they relate to both plant and wildlife SAR are provided in the table below.

Table 2-3: COSEWIC and COSSARO Status Definitions

Status	COSEWIC	COSSARO
Extinct (EXT)	A species that no longer exists.	Any species formally native to Ontario that no longer exists.
Extirpated (EXP)	A species no longer existing in the wild in Canada but occurring elsewhere.	Any native species no longer existing in the wild in Ontario, but existing elsewhere in the wild.

Status	COSEWIC	COSSARO
Endangered (END)	A species facing imminent extirpation or extinction.	Any native species that, based on the best available scientific evidence, is at risk of extinction or extirpation throughout all or a significant portion of its Ontario range if the limiting factors are not reversed.
Threatened (THR)	A species likely to become endangered if limiting factors are not reversed.	Any native species that, based on the best available scientific evidence, is at risk of becoming endangered throughout all or a significant portion of its Ontario range if limiting factors are not reversed.
Special Concern (SC)	A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.	Any native species that, based on the best available scientific evidence, is a species of special concern in Ontario, but is not a threatened or endangered species.
Not at Risk (NAR)	A species that has been evaluated and found to be not at risk.	A species that has been evaluated and found to be not at risk.
Data Deficient (DD)	A species for which there is insufficient information to support a status designation.	A species for which there is insufficient information for a provincial status recommendation.

2.2.5 INVASIVE EXOTIC PLANT SPECIES

Special emphasis was placed on invasive exotic plant species as part of ELC surveys in June 2022 and follow-up vegetation surveys conducted in July 2022. The invasive exotic species targeted for collection of additional information included those identified as Category 1 (aggressive invasive), Category 2 (highly invasive but niche-specific) and Category 3 (moderately invasive but can become locally dominant when the proper conditions exist) in the Invasive Exotic Species Ranking for Southern Ontario (Urban Forest Associates Inc., 2002):

Category 1: Aggressive invasive exotic species that can dominate a site to exclude all other species and remain dominant on the site indefinitely. These are a threat to natural areas wherever they occur because they can reproduce by means that allow them to move long distances. Many of these are dispersed by birds, wind, water, or vegetative reproduction. These are the top priority for control, but control may be difficult. Eradication may be the only option for long-term success.

Category 2: Exotic species that are highly invasive but tend to only dominate certain niches or do not spread rapidly from major concentrations. Many of these spread vegetatively, or by seeds that drop close to the parent plant. They may have been deliberately planted and persist in dense populations for long periods. Control where necessary and limit their spread to other areas.

Category 3: Exotic species that are moderately invasive but can become locally dominant when the proper conditions exist. Control where necessary and limit their spread to other areas.

If a Category 1, 2 or 3 species was present within an ELC polygon, their dominance was noted.

Table 2-4: Select Invasive Exotic Species in City of Windsor Natural Areas

Common Name	Scientific Name	Category No.	Threat
Manitoba Maple	<i>Acer negundo</i>	1	Aggressively invades all habitats
Norway Maple	<i>Acer platanoides</i>	2	Dominates forest canopy
Tree-of-heaven	<i>Ailanthus altissima</i>	2	Replaces native early-successional forest, easily invades disturbed areas from forests to grasslands
Garlic Mustard	<i>Alliaria petiolate</i>	1	Dominates forest/ woodland understory
Flowering Rush	<i>Butomus umbellatus</i>	1	Dominates open marshes
Canada Thistle	<i>Cirsium arvense</i>	1	Dominates forest edges and meadows, prairies and savannahs
European Swallowwort	<i>Vincetoxicum rossicum</i>	1	Dominates meadows and forest understories
Orchard Grass	<i>Dactylis glomerata</i>	3	Invades woodland edges, meadows, prairies and savannahs
Teasel species	<i>Dipsacus</i> sp.	3	Dominates meadows and prairies
Autumn/Russian Olive	<i>Elaeagnus umbellata/angustifolia</i>	1/3	Dominates forest/woodland edges and forms thickets in open meadows/prairies and savannahs
Glossy Buckthorn	<i>Frangula alnus</i>	1	Dominates wetlands, swamps and moist woodlands
Tall Ryegrass	<i>Lolium arundinaceum</i>	3	Dominates moist meadows and prairies
Honeysuckle species	<i>Lonicera japonica, tartarica & maackii</i>	1	Dominates forest/woodland understory and edges, invades meadows/prairies

Common Name	Scientific Name	Category No.	Threat
Purple Loosestrife	<i>Lythrum salicaria</i>	1	Dominates wetlands and wet meadows
White/Yellow Sweet Clover	<i>Melilotus alba/officinalis</i>	2	Dominates meadows and prairies
Chinese Silvergrass	<i>Miscanthus sinensis</i>	3	Dominates wet meadows
White Mulberry	<i>Morus alba</i>	1	Dominates forest/woodland understory and invades open meadows/prairies
Eurasian Water-milfoil	<i>Myriophyllum spicatum</i>	1	Dominates open understory and meadows
Wild Parsnip	<i>Pastinaca sativa</i>	3	Invades meadows
European Reed	<i>Phragmites australis</i> ssp. <i>australis</i>	1	Dominates wetlands and wet meadows
Kentucky Bluegrass	<i>Poa pratensis</i>	2	Dominates prairies
White Poplar	<i>Populus alba</i>	2	Invades meadows
European Buckthorn	<i>Rhamnus cathartica</i>	1	Dominates forest/woodland understory and forms thickets in open meadows/prairies
Black Locust	<i>Robinia pseudo-acacia</i>	2	Dominates forests/woodlands, invades edges and meadows
Multiflora Rose	<i>Rosa multiflora</i>	1	Dominates forest/woodland edges and forms thickets in open meadows/prairies and savannahs
Japanese Knotweed	<i>Reynoutria japonica</i>	2	Dominated wet meadows and moist forests
Common Lilac	<i>Syringa vulgaris</i>	2	Dominates shallow limestone areas
Siberian Elm	<i>Ulmus pumila</i>	2	Invades prairies and savannahs

2.2.6 LARGE TREES AND MATURE GROWTH FORESTS

Old growth or mature forest stands are quite rare throughout the province and particularly in southern Ontario, largely due to past logging practices. Most remnant sites are relatively small stands that have had little or no forestry or vegetation management (MNR, 2010). These older woodlands are valuable for their contributions to genetic, species and ecosystem diversity. Features of old growth or mature forest stands include a broad spectrum of tree sizes with some very tall trees, an uneven canopy with scattered gaps due to fallen trees and large limbs, and abundant fallen logs in various stages of decomposition. According to the Natural Heritage Reference Manual (MNR, 2010), older woodlands could also be defined as having 10 or more native trees/ha >100 yrs old or >10 native trees/ha at least 50 cm DBH.

The Black Oak Heritage Park Area and Ojibway Park Area were always known to contain large old trees. In earlier studies conducted by ERCA, there were also a few large, noteworthy trees documented in Tallgrass Prairie Heritage Park Area and the South Cameron Woodlot Area (ERCA, 2008). Ontario Parks also surveyed all large trees in the Ojibway Prairie Provincial Nature Reserve in the late 1970's/early 1980's, and the tags are still present on the trees. Otherwise, there have been no targeted studies to identify the composition of large trees or mature forest stands in the Windsor natural areas.

To assist in characterizing potential old growth and mature forest stands, data collected during ELC vegetation mapping included basal area calculations, vegetative structure and composition, size class analysis and wildlife features (Lee et al., 1998). These data were evaluated in accordance with ELC descriptors that indicate a stand may be considered old growth if it contains “a self-perpetuating community composed primarily of late seral species that show uneven stand age distribution, including large old trees (generally >120 yrs) without open-grown characteristics.” A stand may be considered mature if it has a successional maturing community dominated by species that are replacing themselves and are likely to remain an important component of the community if it is not disturbed again; significant remnants of early seral stages may still be present.”

In addition to ELC data collection, the natural areas were divided into a grid pattern for further sub-sampling of large, >50 cm DBH tree species (Henry, 2020; Lee et al., 1998). It became evident during initial site evaluations that large diameter trees were present throughout most of the respective natural areas. To get representative samples from across an entire site, a 200 m x 200 m grid with a sampling point in the center of each grid square was used. All large trees (>50 cm DBH) within a 25 m radius of the center point of each grid square were recorded. The DBH, UTM coordinates, and general health condition were recorded for each tree species.

Tree age was estimated using a standardized formula developed and used by the International Society of Arboriculture (ISA) as a non-invasive method to age trees. The formula uses DBH measurements and species-specific growth factors. Age estimates generated from this formula should be considered a rough calculation, as many conditions can influence the growth of trees both regionally and at the site-level (water availability, climate, soil conditions, competition, and overall plant vigor). Nonetheless, the age estimates,

combined with data collected during ELC, can help support the designation of mature and/or old growth forest community types, Significant Woodlands and SWH.

The species-specific growth factors used for the evaluation were obtained from publicly available on-line resources and literature. Where a species-specific growth factor could not be found, literature on the growth characteristics of the species was compared to other known species in the same genus. The growth factor was estimated based on this comparison and professional judgment. The growth factors used for this study are included in Table 2-5.

Table 2-5: Species-Specific Growth Factors for Trees

Common Name	Scientific Name	Growth Factor
Eastern Cottonwood	<i>Populus deltoides</i>	2.0
Silver Maple	<i>Acer saccharinum</i>	3.0
Red Maple	<i>Acer rubrum</i>	4.5
Sugar Maple	<i>Acer saccharum</i>	5.5
Paper Birch	<i>Betula papyrifera</i>	5.0
Shagbark Hickory	<i>Carya ovata</i>	7.5
Pignut Hickory	<i>Carya glabra</i>	7.5
Bitternut Hickory	<i>Carya cordiformis</i>	7.0
Kentucky Coffee-tree	<i>Gymnocladus dioica</i>	3.0
Green Ash/Red Ash	<i>Fraxinus pennsylvanica</i>	4.0
White Ash	<i>Fraxinus americana</i>	5.0
Black Walnut	<i>Juglans nigra</i>	4.5
Black Cherry	<i>Prunus serotina</i>	5.0
White Oak	<i>Quercus alba</i>	5.0
Bur Oak	<i>Quercus macrocarpa</i>	5.0
Black Oak	<i>Quercus velutina</i>	4.0
Northern Red Oak	<i>Quercus rubra</i>	4.0
Swamp Pin Oak	<i>Quercus palustris</i>	3.0
Shumard Oak	<i>Quercus shumardii</i>	3.0
Swamp White Oak	<i>Quercus bicolor</i>	5.0
Linden or Basswood	<i>Tilia species</i>	3.0
American Elm	<i>Ulmus americana</i>	4.0
American Beech	<i>Fagus grandifolia</i>	6.0
Sycamore	<i>Platanus occidentalis</i>	4.0
Eastern Hop-hornbeam	<i>Ostrya virginiana</i>	7.0
Eastern Redbud	<i>Cercis canadensis</i>	7.0

Common Name	Scientific Name	Growth Factor
Sassafras	<i>Sassafras albidum</i>	4.0
Common Hackberry	<i>Celtis occidentalis</i>	4.0

2.3 WILDLIFE AND WILDLIFE HABITAT

Wildlife and wildlife habitat field evaluations focused primarily on anurans (frogs) and bats at this time. Data on birds, other mammals, amphibians and reptiles, fish and terrestrial invertebrates are summarized from the secondary source reviews, including NHIC occurrence records and site-specific natural heritage reports (Appendix B). Incidental observations of wildlife were recorded during all field surveys. These results are included in the respective site-specific subsections below and in species lists in Appendix A.

2.3.1 ANURAN CALL SURVEYS

Amphibians require aquatic habitats for mating, egg incubation and larval development. Because of their dependence on water, amphibians are particularly susceptible to changes in local environmental conditions and are therefore ideal indicators of local ecosystem health (Bird Studies Canada, 2009 Edition). Additionally, their occurrence and abundance can be used to inform a SWH designation.

In March 2022, field reconnaissance for the presence of suitable aquatic breeding habitat was completed in each of the natural areas, with exception of Ojibway Shores, Chappus Natural Area and St. Clair College Prairie and Woods due to site access constraints. There were 15 survey locations selected across eight sites (Table 2-6).

Table 2-6: Anuran Call Survey Locations

Natural Area	Survey Station No. ¹	General Habitat Description
Black Oak Heritage Park Area	AM-BL01	Low-lying forest, within PSW
	AM-BL02	Flooded forest
	AM-BL03	Wet, moist drain
Ojibway Park Area	AM-OJ01	Man-made pond
	AM-OJ02	Pin Oak swamp
Tallgrass Prairie Heritage Park Area	AM-TG01	Flooded forest, within PSW
Ojibway Provincial Prairie Nature Reserve Area	AM-OPP01	Oak savannah/wet meadow
	AM-OPP02	Meadow marsh/moist savannah, adjacent to PSW
Spring Garden Natural Area	AM-SG01	Pin Oak Swamp, within PSW
	AM-SG02	Oak-dominated swamp, within PSW
	AM-SG03	Moist forest and meadow, within PSW

Natural Area	Survey Station No. ¹	General Habitat Description
Oakwood Natural Area	AM-OW01	Oak-dominated swamp
South Cameron Woodlot Area	AM-SC01	Pin Oak swamp, adjacent to PSW
	AM-SC02	Flooded/moist forest
Malden Park	AM-MP01	Man-made pond

Frog and toad species (anurans) have distinctive mating calls which can be used in species identification. The protocol for anuran call surveys was based on the Marsh Monitoring Program Participant's Handbook for Surveying Amphibians (Bird Studies Canada, 2009 Edition). The 15 surveys locations were visited three times each (April, May and June) to capture any changes that might occur across the peak breeding season. Surveys were conducted at night during appropriate weather conditions.

Anuran call surveys used Call Level Codes to categorize activity intensity and an Abundance Count to estimate numbers.

Code 1 - Individuals can be counted; calls are not simultaneous. An Abundance Count records the number of individual frogs of each species calling beside the Code.

Code 2 - Calls distinguishable, some simultaneous calling. An Abundance Count estimates the number of individual frogs of each species calling beside the Code.

Code 3 - Full chorus; calls continuous and overlapping. There are too many overlapping calls to allow for any reasonable Abundance Count or estimate.

Results of anuran call surveys also documented the condition of vernal pool and wetland habitats. Suitable terrestrial features (such as downed logs for egg-laying) were noted during the anuran call surveys and ELC vegetation community mapping.

Surveys specific to documenting other amphibians (i.e., salamanders) or reptiles (i.e., turtles) were not completed as part of this natural heritage evaluation due to well documented secondary source information for the Ojibway Prairie Complex and adjacent areas. The results from secondary source review are summarized in the site-specific sections below and in the referenced Appendices.

2.3.2 BAT DETECTOR SURVEYS

Ontario bat species have a variety of species-specific echolocation call structures, enabling acoustic identification. Bat acoustic surveys were conducted to detect nocturnal bat activity during the maternal brood-rearing period in June through mid July 2022. A combination of MNRF protocols, industry standards and professional judgement was used for documenting bat activity. All nocturnal bat activity was recorded from 30 minutes before sunset to 30 minutes after sunrise.

Bat detectors (Song Meter Mini Bat Ultrasonic Recorder with built in microphone) were deployed throughout the natural areas between June 1 and July 14, 2022. A total of 45 survey locations were evaluated (Table 2-7). The first set of surveys were conducted from June 1 to June 10; the second set of surveys were conducted from June 13 to July 4; and the third set of surveys were conducted from June 29 to July 14, 2022.

Microphones were positioned as high as possible at locations where higher bat activity levels were likely to occur, such as habitat edges adjacent to open grasslands and openings in mature forests and/or woodlands. To the extent possible, microphones were kept 1 to 2 m from vegetation and oriented toward open areas to capture clean recordings for accurate species detection and identification. Bat detectors were configured to begin recording when signals greater than 14 kHz were detected. Upon trigger, a 2 to 5-second recording was saved. All recordings were made in .wav format with a 384 kHz sampling frequency, 12 dB gain, and 16-bit resolution, resulting in real-time, full-spectrum data that afford greater accuracy and confidence when identifying recordings of bat calls to species.

Table 2-7: Bat Detector Survey Station Locations

Natural Area Name	Round/Date	Survey Station No. ¹
Black Oak Heritage Park Area	Round 1 May 27 - June 12	BA-BL01 Oak Hickory forest opening
		BA-BL02 Edge of meadow near parking lot
		BA-BL03 Edge of meadow
	Round 2 June 14 – June 22	BA-BL04 Open meadow NW
	Round 3 July 4 – July 14	BA-BL05 Oak-dominated forest
Ojibway Park Area	Round 1 May 31 – June 13	BA-OJ01 Ojibway Park pond
		BA-OJ02 Tallgrass woodland near pond
		BA-OJ03 Ojibway Nature Centre bird feeder area
		BA-OJ04 Black Oak woodland

Natural Area Name	Round/Date	Survey Station No. ¹
	Round 2 June 23 – July 4	BA-OJ05 Small dry prairie
		BA-OJ06 Black Oak forest
Tallgrass Prairie Heritage Park Area	Round 1 June 14 – June 24	BA-TG01 Tallgrass woodland
		BA-TG02 West edge of pond
	Round 2 July 4 – July 14	BA-TG03 Open tallgrass prairie NW corner
Ojibway Prairie Provincial Nature Reserve Area	Round 1 June 1 -June 12	BA-OPP01 Sassafrass stand
		BA-OPP02 Edge of woodland in open area
	Round 2 June 14 – June 24	BA-OPP03 Tallgrass prairie edge
		BA-OPP04 Edge of hydrocut
	Round 3 July 4 – July14	BA-OPP05 Prairie lookout, Sprucewood Ave.
Spring Garden Natural Area	Round 1 June 1 -June 12	BA-SG01 Pond edge
		BA-SG02 Pond edge
		BA-SG03 Cultural meadow
	Round 2 June 14 – June 24	BA-SG04 Reddock Ave.
		BA-SG05 Gratiot St.
	Round 3 June 29 – July14	BA-SG06 Open prairie edge NE
		BA-SG07 Turkey Creek/Grand Marais Drain
Oakwood Natural Area	Round 1 June 14 – June 18	BA-OW01 Cultural meadow
South Cameron Woodlot Area	Round 1 June 13 – June 22	BA-SC01 Deciduous swamp, near paved trail
		BA-SC02 Cultural meadow edge
Malden Park	Round 1 June 21 – July 4	BA-MP01 Pond edge
	Round 2 June 30 – July 8	BA-MP02 Edge of hill NW
		BA-MP03 South side of hills

2.3.2.1 Analytical Processing

All recordings were initially filtered using the Batch File Scrubber of the Sonobat Data Wizard (version 4.4.1). The scrubber was set to remove files containing only tonal signals below 5 kHz and any file where tonal signals resembled noise. Recordings were initially identified to species using Sonobat version 4.4.1 (Sonobat™) automated processing software, running the classifier for the Northeast region and the northeastern US and southern Ontario subregions. Automated classification can provide accurate classifications for clear recordings with a high signal-to-noise ratio, especially for regions of low species diversity. However, most field recordings contain ambient noise which can limit the accuracy of automated software and its ability to detect echolocation calls within recordings. As such, a subset of the recordings was also classified manually.

When the automated software cannot classify a recording to a specific species due to poor recording quality or call feature overlap between multiple species, it classifies the bat pass as either belonging to a high-frequency bat or a low-frequency bat. The former emits calls with a minimum frequency above 35 kHz, while the latter emits calls with a minimum frequency below 35 kHz. In Ontario, all bat SAR emit calls in the high-frequency range. Specifically, WSP surveys aimed to identify the presence and level of activity of all bat species with a focus on SAR species. For the first round of surveys, all high-frequency bat passes auto-classified to a specific species were selected for manual classification. Given that the manual classifications agreed with all auto-classifications to Eastern Red Bat, recordings from the second and third rounds of surveys auto-classified as Eastern Red Bat were not manually vetted.

The automated classification used the 'consensus classification' decision method in Sonobat. Up to 32 calls within each recording were classified based on over 30 acoustic parameters. The software uses a discriminant analysis to provide an accuracy probability for each classification and only calls with a probability >90% were accepted. The manual classification was accomplished by comparing qualitative and quantitative parameters of recorded bat calls to a library of known species parameters. Parameters used for species identification included the: frequency of maximum energy, minimum frequency, maximum frequency, call duration, the slope of the call; and other more qualitative parameters such as the time-frequency shape of the call, the position of the knee, presence of inflections and terminal curvatures. Less importance was placed on maximum frequency due to its susceptibility to atmospheric attenuation. Calls that could not be classified to a single species were placed in a group named after the two or more species most likely to have produced the call.

2.4 INCIDENTAL OBSERVATIONS OF WILDLIFE AND WILDLIFE HABITAT

During all field surveys, any wildlife sightings, evidence or signs of wildlife use, potential habitat features, or other things of note were documented. Findings are included in the site-specific subsections and field survey species lists (Appendix A).

3 BIOPHYSICAL ENVIRONMENT

A review of background information, ground-truthing, and surveys were completed to provide site-specific context for extant biophysical conditions within the natural areas, including landform, physiography, and geology but focusing on the presence of terrestrial, wetland and aquatic features. The following sections summarize the key biological environment features identified through the desktop studies and field surveys.

3.1 SECONDARY SOURCE REVIEW

Rare species lists gathered from existing databases and reports are provided in Appendix B. A majority of the species information was obtained from the NHIC, atlases and iNaturalist. Written reports from the City, ERCA, MNRF and other consultants also contributed to the understanding of historic and existing conditions (e.g., natural heritage features and additional sensitivities), as well as rare species occurrences in the natural areas. Information from these secondary sources is summarized in the report subsections below.

3.1.1 LANDFORM AND PHYSIOGRAPHY

The study area lands occur in the physiographic region known as the St. Clair Clay Plain. The St. Clair Clay Plain adjoins Lake St. Clair to Lake Erie and both lakes to Lambton County via the St. Clair River. There are minor variations in levelness across the plain, which have had a great effect on vegetation and soils (Putnam & Chapman, 1984). The 11 natural areas are situated within the Essex Clay Plain sub-region of the St. Clair Clay Plain, which is a low-relief till plain smoothed by the action of glacial lakes that covered the area following the final retreat. Glacial lakes left shallow deposits of lacustrine clay, smoothed knolls, and a deep cover of overburden on limestone bedrock (Putnam & Chapman, 1984 and Chapman & Putman, 2007). According to the Ontario Geologic Survey Map P.2715 Physiography of Southern Ontario (Putnam & Chapman, 1984), all 11 natural areas are within a sand plain physiographic landform, with the exception of the northeast portion of the South Cameron Woodlot Area, which is within a beveled till plain physiographic landform.

3.1.2 SOIL AND TERRAIN

The soil on any site is a complex result of a distinct set of conditions, including climate, vegetation, relief, drainage, parent material and cultural practices (Richards et al., 1949). A range of soil types have been mapped across the natural areas (Richards et al., 1949). Ojibway Shores and Black Oak Heritage Park Area have an undulating to rolling topography with Burford Loam, a well-drained brown gravelly loam over reddish brown clay loam. Ojibway Park Area and the west portions of Chappus Natural Area, Tallgrass Prairie Heritage Park Area and Ojibway Prairie Provincial Nature Reserve Area have nearly level topography with poorly drained Granby Sand, a dark grey sandy loam over grey or mottled sand with clay at depths of three feet or more. Over the east portions of Chappus Natural Area, Tallgrass Prairie

Heritage Park Area and Ojibway Prairie Provincial Nature Reserve Area, the north and south portions of Malden Park, west and east portions of Spring Garden Natural Area, and covering the entire Oakwood Natural Area and St. Clair College Prairie and Woods, topography transitions to undulating with fair to poorly drained Berrien Sand, a brown sand over yellow and then mottled sand with clay at a depth of three to six feet. Running through the center of Malden Park and Spring Garden Natural Area is a pocket of Plainfield Sand, a light brown and yellow sand over grey sand that lies in undulating to rolling terrain with good to excessive drainage. A small inclusion of Plainsfield Sand is also present in St. Clair College Prairie and Woods.

Lastly, the South Cameron Woodlot Area has almost level topography with Brookston Clay Loam present in the west portion of the site, adjacent to Brookston Clay to the north and east. Brookston Clay Loam is a dark clay loam over mottled and blue-grey gritty clay and clay loam. Brookston Clay is dark clay over mottled clay then blue-grey compact gritty. No loam is present. Both soils are characterized as having poor natural drainage.

3.1.3 DRAINAGE

Publicly available maps and databases were queried for the presence of watercourses, waterbodies, municipal drains, and wetlands in the natural areas. The natural areas are located within the Turkey Creek sub-watershed of the Detroit River. Many of the open municipal drains that run through the natural areas are tributaries of Turkey Creek. A portion of Turkey Creek is also referred to as Grand Marais Drain as it runs through the City of Windsor. Turkey Creek/Grand Marais Drain begins east of Central Avenue and flows west through the Spring Garden Natural Area and southern portion of Ojibway Prairie Provincial Nature Reserve Area before eventually discharging into the Detroit River in the Town of LaSalle. Although Turkey Creek has been largely channelized, portions of the watercourse and its tributaries are still natural and provide important habitat for a variety of plants and wildlife, many of which are rare and at risk.

Other water sources in the form of palustrine swamps and marshes are also found extensively throughout the natural areas. Over 200 ha of these wetland types have been evaluated as provincially significant. These include the Black Oak Wetland Complex, Ojibway Prairie Wetland Complex, Oakwood Park Wetland, and South Cameron Wetland Complex.

Lastly, many sites contain man-made ponds of various sizes and depths, including Ojibway Park Area, Tallgrass Prairie Heritage Park Area, Ojibway Prairie Provincial Nature Reserve Area, Spring Garden Natural Area and Malden Park.

3.2 FLORA AND ECOLOGICAL LAND CLASSIFICATION

3.2.1 REGIONAL CONTEXT

The City of Windsor sits within the Mixedwood Plains Ecozone and Ecoregion 7E, Lake Erie-Lake Ontario Ecoregion. Ecoregion 7E is the southwestern most extremity of southern Ontario, bounded by Lake St. Clair to the north, the Detroit River to the west, and Lake Erie to the south. The flora and fauna of Ecoregion 7E are the most diverse in Canada and include provincially significant plants, animals and vegetation communities found only in the remnants of Carolinian forests, tallgrass prairies and alvars in the region (Wester et al., 2018).

Within Ecoregion 7E, the City occurs in the Essex Ecodistrict 7E-1. More specifically, Ecodistrict 7E-1 is part of the Warm Eastern Canadian Temperate Deciduous Forest (Wester et al., 2018). Windsor's natural areas are all located in the warmest part of the province, with the lowest annual precipitation and longest growing season (Richards et al., 1949). Since the time of European settlement in the 1830's, much of the original natural landscape has either been removed or extremely degraded as a direct or indirect result of clearing and drainage for timber, agriculture and urban development (ERCA, 1986; Oldham, 1983). However, deciduous forests, now mostly small and scattered, still contain unique tree species such as Kentucky Coffee-tree, Black Gum, Blue Ash, Chinquapin Oak, Black Oak, Honey Locust, Swamp White Oak, Swamp Pin Oak, Shellbark Hickory, and Pawpaw (Wester et al., 2018).

Historically, tallgrass prairie and savannah were present as an almost continuous strip along the shoreline of the western Lake Erie basin (MNRF, 2021). On the Canadian side, tallgrass prairies were found in Windsor along the shores of the Detroit River and along the eastern Lake St. Clair shoreline. Approximately 45 square kilometers (km) of tallgrass prairie and savannah were estimated present before European settlement (MNRF, 2021). Once dominant, these ecosystems now represent only a very small portion of the Ecodistrict. The Ojibway Prairie Complex, comprising six of the natural areas evaluated in this report, contains the largest remnants of tallgrass ecosystems left in the region.

3.2.2 OJIBWAY SHORES

Ojibway Shores is approximately 11 ha and is bordered by the Detroit River to the west, Black Oak Heritage Park Area to the east, Morterm Limited port terminal facility to the south, and construction of the new Canadian Inspection Plaza and Gordie Howe International Bridge to the north (Figure 1-1). The site contains approximately 500 linear meters of relatively undisturbed natural shoreline, representing the last remaining stretch of undeveloped shoreline in the City of Windsor.

Ojibway Shores was first examined as a Candidate Natural Heritage Site by ERCA in 1992. The results of their field evaluation indicated the property was comprised of a young woodland dominated by pioneer tree species such as Maples, Cottonwoods and Elms. The southern portion of the site was mesic and contained a Poplar-Elm dominated swamp. Open habitat was described as early successional fields with a rich layer of forbs and grasses including a

few SAR and provincially rare plant species. ERCA noted that the site was found in a natural condition at the time, with no dumping and few exotic species despite being located in an industrialized area.

In 2017, ERCA and the Essex County Field Naturalists Club revisited Ojibway Shores to undertake follow-up surveys to the 1992 natural heritage evaluation (Gardner-Costa et al., 2017). An ELC vegetation community mapping and analysis was completed. Results indicated the presence of eight ELC Vegetation Types in six Community Series (Table 3-1, Figure 3-1). The Vegetation Types represent those described in Lee, 2008. Based on these results, Ojibway Shores can be described as having high vegetation community diversity.

The vegetation community composition of Ojibway Shores is 99% (10.63 ha) terrestrial habitat and 1% (0.09 ha) aquatic habitat.

The terrestrial uplands support one herbaceous Mixed Meadow community series and four woody plant community series, including Treed Shoreline, Deciduous Woodland, Deciduous Thicket and Deciduous Forest. The aquatic habitat supports one Shallow Water Aquatic community. Based on these results, Ojibway Shores is characterized primarily as forest (46.00% or 4.93 ha) and woodland (41.23% or 4.42 ha) habitat, followed by meadow (6.00% or 0.64 ha), thicket (5.33% or 0.57 ha), shallow water (0.85% or 0.09 ha) and treed shoreline (0.65% or 0.07 ha).

The floristic quality and plant community diversity in Ojibway Shores is discussed in more detail in the Ojibway Shores Natural Heritage Inventory/Evaluation (Gardner-Costa et al., 2017). Below is a summary table of the ELC mapping results from that document, including the various community types and the area associated with each (Table 3-1 and Table 3-2). The ELC vegetation community mapping results are shown in Figure 3-1.

Table 3-1: Ojibway Shores ELC Vegetation Community Diversity

Community Class	Community Series	ELC Code	Ecosite / Vegetation Type	G-rank	S-rank	Area (ha)	%
Shoreline	Treed Shoreline	SHTM1-1	Cottonwood Mineral Treed Shoreline Type			0.07	0.65
Meadow	Mixed Meadow	MEMM3	Dry – Fresh Mixed Meadow Ecosite			0.64	6.00
Thicket	Deciduous Thicket	THDM2-4	Gray Dogwood Deciduous Shrub Thicket Type			0.57	5.33
Woodland	Deciduous Woodland	WODM4-4	Dry – Fresh Black Walnut Deciduous Woodland Type			3.17	29.53
		WODM5-1	Fresh – Moist Poplar Deciduous Woodland Type			1.25	11.66
Forest	Deciduous Forest	FODM7-4	Fresh – Moist Black Walnut Lowland Deciduous Forest Type	G4?	S2S3	0.80	7.48
		FODM8-3	Fresh – Moist Cottonwood Deciduous Forest Type			4.13	38.52
Shallow Water	Mixed Shallow Aquatic	SAM1-2	Duckweed Mixed Shallow Aquatic Type			0.09	0.85
Total						10.72	100

Table 3-2: Ojibway Shores ELC Community Statistics

ELC Community Class	Area (ha)	Proportion (%)
Terrestrial	10.63	99.11
Shoreline	0.07	0.65
Meadow	0.64	6.00
Thicket	0.57	5.33
Woodland	4.42	41.23
Forest	4.93	46.00
Aquatic	0.09	0.85
Shallow Water	0.09	0.85
Total Habitat:	10.72	100.02

3.2.2.1 Rare Vegetation Communities

According to the Ojibway Shores Natural Heritage study (Gardner-Costa et al., 2017), the following rare vegetation community was identified and mapped in the site. The rarity ranks for the vegetation community are in accordance with those identified by the NHIC. The property contains one vegetation community that is ranked provincially rare:

- Fresh – Moist Black Walnut Lowland Deciduous Forest (FODM7-4; G4?/S2S3)

This vegetation community comprises 0.80 ha or 7.48% of the natural area (Table 3-1; Figure 3-1).

In addition to the rare plant community above, Ojibway Shores also contains land with other environmentally significant designations, including a portion of the provincial Black Oak Wetland Complex (PSW), Prairie Remnants (Black Oak Woods) Life ANSI, and an Environmentally Significant Area regulated by ERCA (Figure 3-2).

3.2.2.2 Significant Trees

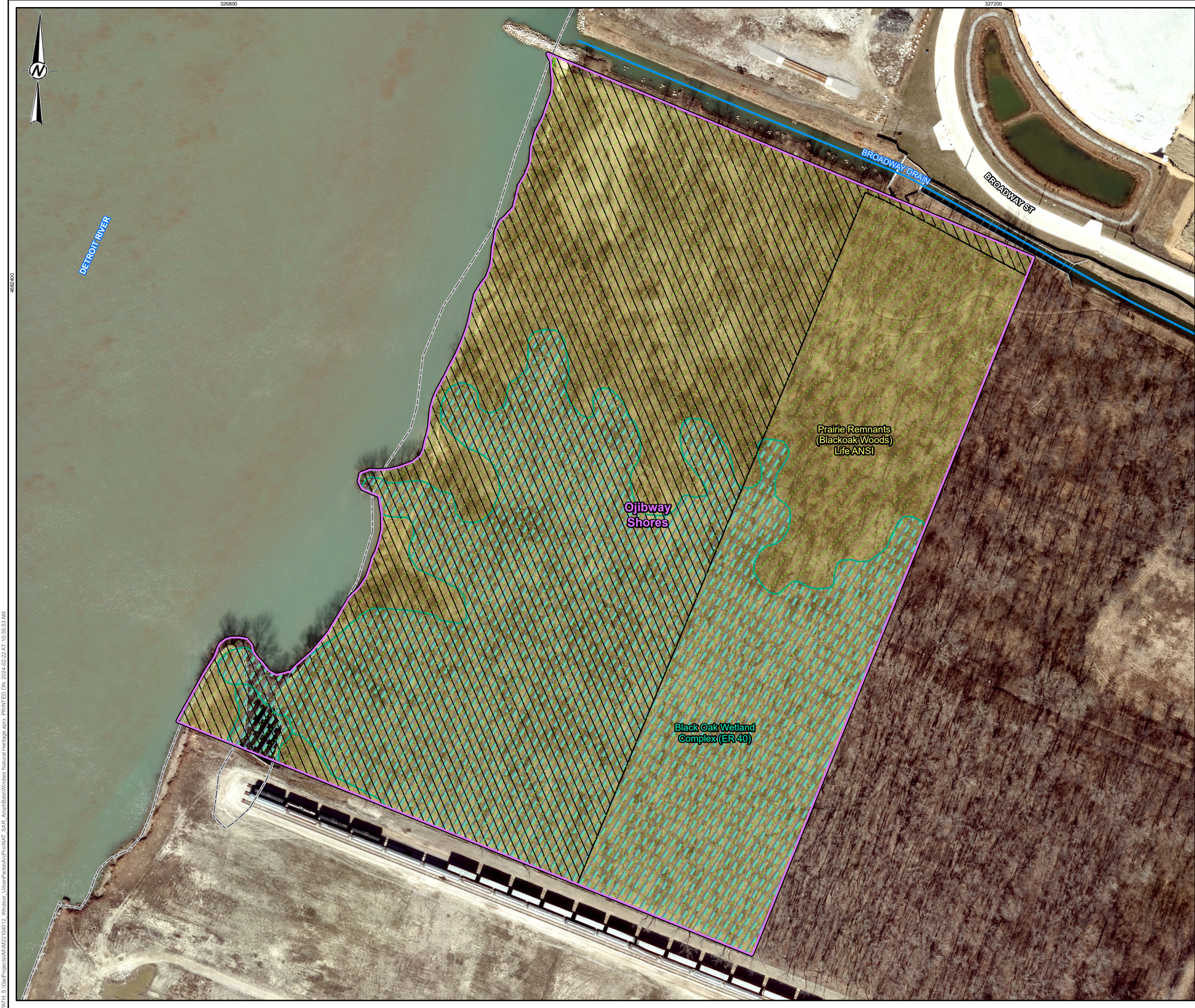
Significant trees were not evaluated in Ojibway Shores due to property access limitations at the time of the surveys.

3.2.2.3 Plant SAR and Provincially Rare Species

In field surveys conducted by ERCA and the Field Naturalists' Club (Gardner-Costa et al., 2017), there was a total of 12 provincially rare plant species observed in Ojibway Shores, including three listed as SAR.

In addition to the species known to occur in Ojibway Shores, a review of secondary source information from the NHIC indicates that many additional provincially rare species (including SAR) may occur within and/or around Ojibway Shores where suitable habitat exists.

Table 3-3: Plant SAR and Provincially Rare Species Observed in Ojibway Shores
(Removed to protect sensitive information)



- LEGEND**
- NATURAL HERITAGE REVIEW BOUNDARY
 - REGULATION AREA (ESSEX REGION CONSERVATION AUTHORITY)
 - ENVIRONMENTALLY SIGNIFICANT AREA
 - EVALUATED PROVINCIAL WETLAND (LAND INFORMATION ONTARIO, 2021)
 - LIFE ANSI (LAND INFORMATION ONTARIO, 2021)
 - MUNICIPAL DRAIN

REFERENCE(S)
COUNTY OF ESSEX, IMAGERY SERVICE: COUNTY 2022 AIRPHOTO, COUNTY 2021 AIRPHOTOMAP DATA © OPENSTREETMAP CONTRIBUTORS, MICROSOFT, FACEBOOK, INC. AND ITS AFFILIATES, ESRI COMMUNITY MAPS CONTRIBUTORS, MAP LAYER BY ESRI. LAND INFORMATION ONTARIO.
CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE – ONTARIO, CANADA.
PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N.

CLIENT

PROJECT
**PROPOSED NATIONAL URBAN PARK IN WINDSOR
OJIBWAY PRAIRIE COMPLEX
NATURAL HERITAGE REVIEW REPORT**

TITLE
**DESKTOP NATURAL HERITAGE REVIEW
OJIBWAY SHORES**

	CONSULTANT	YYYY-MM-DD	2024-02-22
	DESIGNED	SS	
	PREPARED	HB	
	REVIEWED		
	APPROVED		

3.2.2.4 Invasive Exotic Species

Many of the non-native species found in Ojibway Shores during natural heritage assessments can be further characterized as invasive or aggressive species (Table 3-4; Urban Forest Associates Inc., 2002). These species, if left unchecked, have the potential to become dominant in the landscape and threaten native biodiversity. Below is a list of Category 1 to 3 invasive exotic species that are recommended for population monitoring in the site. These species are most likely to require targeted management to keep populations under control or to eradicate them entirely.

Table 3-4: Select Invasive Exotic Species in Ojibway Shores

Common Name	Scientific Name	Category No. ¹
Manitoba Maple	<i>Acer negundo</i>	1
Tree-of-heaven	<i>Ailanthus altissima</i>	2
Garlic Mustard	<i>Alliaria petiolata</i>	1
Flowering-rush	<i>Butomus umbellatus</i>	1
Canada Thistle	<i>Cirsium arvense</i>	1
Autumn Olive	<i>Elaeagnus umbellata</i>	1
Japanese Honeysuckle	<i>Lonicera japonica</i>	1
Amur Honeysuckle	<i>Lonicera maackii</i>	1
Tartarian Honeysuckle	<i>Lonicera tatarica</i>	1
White Sweet Clover	<i>Melilotus alba</i>	2
Yellow Sweet Clover	<i>Melilotus officinalis</i>	2
White Mulberry	<i>Morus alba</i>	1
European Reed	<i>Phragmites australis</i> ssp. <i>australis</i>	1
Kentucky Bluegrass	<i>Poa pratensis</i> ssp. <i>pratensis</i>	2
White Poplar	<i>Populus alba</i>	2
European Buckthorn	<i>Rhamnus cathartica</i>	1
Glossy Buckthorn	<i>Frangula alnus</i>	1
Black Locust	<i>Robinia pseudo-acacia</i>	2
Multiflora Rose	<i>Rosa multiflora</i>	1
Common Lilac	<i>Syringa vulgaris</i>	2
Siberian Elm	<i>Ulmus pumila</i>	2

Notes: ¹ Category 1 (aggressive invasive); Category 2 (highly invasive but niche-specific); and Category 3 (moderately invasive but can become locally dominant when the proper conditions exist).

3.2.3 BLACK OAK HERITAGE PARK AREA

Black Oak Heritage Park Area is approximately 97 ha and is located adjacent to Ojibway Shores and the Morterm Limited port terminal facility on the west. The natural area is bound by Broadway Street to the north, Ironwood Drive to the south, and Ojibway Parkway and the Essex Terminal Railway (ETR) corridor to the east (Figure 1-1). In 1987, the City acquired land from the Canadian Salt Company and set aside the most significant woodland as Black Oak Heritage Park. The property includes maintained trails for pedestrian access and passive recreational use.

The first natural heritage assessment was conducted by ERCA in a portion (46 ha) of Black Oak Heritage Park Area in the early 1980's. At the time, it was noted that most of the site was Black Oak-dominated forest with a fairly open canopy and a large proportion of tallgrass prairie species in the understory (Oldham, 1983). Fifteen provincially rare plant species, including three SAR, were documented at the time.

In 1992, ERCA visited another portion of the site, just north of the evaluated lands in 1983, as part of their Candidate Natural Heritage Site biological inventories. In this location, the vegetation communities were undergoing succession towards Oak-Hickory woodland. Several significant plant species were observed again; however, it was noted that many aggressive tree, shrub, and herbaceous species were invading the area. A low sand dune, running parallel to the Detroit River and associated with the post-glacial Lake Rouge, was identified as a significant natural heritage feature (ERCA, 1992).

Most recently, the vegetation communities, flora and fauna of Black Oak Heritage Park were assessed in support of the Black Oak Heritage Park Management Plan (Sage Earth, 2019). The Management Plan documented the presence of rare vegetation communities, flora, fauna, and natural heritage features and provided management recommendations to enhance and restore diminished habitats for rare and provincially significant plants and wildlife (Sage Earth, 2019).

Results of the ELC vegetation community mapping and analysis undertaken by Sage Earth (2019) and confirmed and/or updated by WSP indicates the presence of 18 natural ELC Vegetation Types in seven Community Series (Table 3-5, Figure 3-5). In addition, there were two anthropogenic Community Series present, Treed Agriculture and Commercial and Industrial, that represent constructed land uses. Based on these results, Black Oak Heritage Park Area can be described as having very high vegetation community diversity.

The ELC vegetation communities in Black Oak Heritage Park Area are comprised of 78.27% (75.56 ha) terrestrial habitat, 14.73% (14.22 ha) wetland habitat, 1.73% (1.67 ha) aquatic habitat and 5.27% (5.08 ha) constructed land uses.

Terrestrial habitat is comprised of two herbaceous meadow community series, Forb Meadow and Mixed Meadow, and three woody plant community series, Deciduous Savannah, Deciduous Woodland, and Deciduous Forest. Wetlands include Deciduous Swamp communities. The aquatic ecosystem includes one Submerged Shallow Aquatic community. Based on the area associated with these community series, Black Oak Heritage Park Area

can be characterized primarily as forest (57.67% or 55.67 ha), followed by swamp (14.73% or 14.22 ha), meadow (11.27% or 10.88 ha), woodland (6.13% or 5.92 ha), savannah (3.20% or 3.09 ha) and shallow water (1.73% or 1.67 ha).

The floristic quality and plant community diversity in Black Oak Heritage Park Area is discussed in more detail in the Black Oak Heritage Park Management Plan (Sage Earth, 2019). Below is a summary table of the ELC mapping results from that document, including the various community types and the area associated with each (Table 3-5 and Table 3-6). The ELC vegetation community mapping results are shown in Figure 3-3.

Table 3-5: Black Oak Heritage Park Area ELC Vegetation Community Diversity

Community Class	Community Series	ELC Code	Ecosite / Vegetation Type	G-rank	S-rank	Area (ha)	%
Meadow	Forb Meadow	MEFM4	Fresh – Moist Forb Meadow Ecosite			3.76	3.89
	Mixed Meadow	MEMM2	Fresh – Moist Mixed Tallgrass Prairie Ecosite	G2	S1	2.87	2.97
		MEMM3	Dry – Fresh Mixed Meadow Ecosite			4.25	4.41
Savannah	Deciduous Savannah	SVD	Deciduous Savannah			3.09	3.20
Woodland	Deciduous Woodland	WODM5	Fresh – Moist Deciduous Woodland Ecosite			2.26	2.34
		WODM5-1	Fresh – Moist Poplar Deciduous Woodland Type			1.23	1.27
		WODM5-3	Fresh – Moist Manitoba Maple Deciduous Woodland Type			1.81	1.88
		WODM6	Fresh – Moist Tallgrass Deciduous Woodland Ecosite	G1/G2	S1	0.62	0.64
Forest	Deciduous Forest	FODM2-2	Dry – Fresh Oak – Hickory Deciduous Forest Type	G4?	S3S4	16.13	16.71

Community Class	Community Series	ELC Code	Ecosite / Vegetation Type	G-rank	S-rank	Area (ha)	%
Forest	Deciduous Forest	FODM7	Fresh – Moist Lowland Deciduous Forest Ecosite			1.52	1.58
		FODM7-4	Fresh – Moist Black Walnut Lowland Deciduous Forest Type	G4?	S2S3	17.60	18.23
		FODM7-7	Fresh – Moist Manitoba Maple Lowland Deciduous Forest Type			2.31	2.40
		FODM8-1	Fresh – Moist Poplar Deciduous Forest Type			4.90	5.08
		FODM8-3	Fresh – Moist Cottonwood Deciduous Forest Type			4.59	4.76
		FODM10-2	Fresh – Moist Oak Carolinian Deciduous Forest Type			8.61	8.91
Swamp	Deciduous Swamp	SWDM1-1	Swamp White Oak Mineral Deciduous Swamp Type	G1G2	S2S3	10.01	10.37
		SWDM1-3	Pin Oak Mineral Deciduous Swamp Type	G2	S2S3	4.21	4.36
Shallow Water	Submerged Shallow Aquatic	SAS1-4	Water Milfoil Submerged Shallow Aquatic Type			1.67	1.73
Constructed*	Greenlands	CGL/MEFM4	Parkland / Fresh – Moist Forb Meadow Ecosite			0.49	0.51
	Commercial and Institutional	CVC				3.02	3.12

Community Class	Community Series	ELC Code	Ecosite / Vegetation Type	G-rank	S-rank	Area (ha)	%
Agriculture*	Treed Agriculture	TAGM3	Deciduous Plantation			1.57	1.62
Total						96.54	100

Notes: * Indicates an anthropogenic community series as described in Lee, 2008.

Table 3-6: Black Oak Heritage Park Area ELC Community Class Statistics

ELC Community Class	Area (ha)	Proportion (%)
Terrestrial	75.56	78.27
Meadow	10.88	11.27
Savannah	3.09	3.20
Woodland	5.92	6.13
Forest	55.67	57.67
Wetland	14.22	14.73
Swamp	14.22	14.73
Aquatic	1.67	1.73
Shallow Water	1.67	1.73
Anthropogenic	5.08	5.27
Constructed	3.51	3.64
Agriculture	1.57	1.63
Total Habitat:	96.54	100

3.2.3.1 ELC Community Descriptions

The vegetation communities in Black Oak Heritage Park were evaluated in detail by Sage Earth (2019) as part of the creation of a Management Plan for the property. Below is a summary of the dominant species comprising the vegetation communities that make up most of the natural area, as described in the Management Plan (Sage Earth, 2019).

There are seven different types of deciduous forest communities present in Black Oak Heritage Park Area. The largest by area is provincially rare Dry – Moist Black Walnut Lowland Deciduous Forest Type (FOD7-4), followed by Dry – Fresh Oak – Hickory Deciduous Forest Type (FODM2-2).

The Dry – Moist Black Walnut Lowland Deciduous Forest canopy is dominated by Black Walnut with abundant Black Locust, Common Hackberry, Eastern Cottonwood, Black Cherry, and Black Oak. The subcanopy is abundant in American Elm, Black Locust, Black Walnut, Manitoba Maple, and White Mulberry. The understory contains both native and invasive shrub species such as Rough-leaved Dogwood, Silky Dogwood and Amur Honeysuckle. The groundcover layer contains a variety of native Sedges (*Carex* sp.) and Goldenrod (*Solidago* sp.) species, Wild Geranium, Riverbank Grape, Sweet-scent Bedstraw, and White Avena. Cool-season grasses such as Kentucky Bluegrass, Downy Brome, and Orchard Grass are also present.

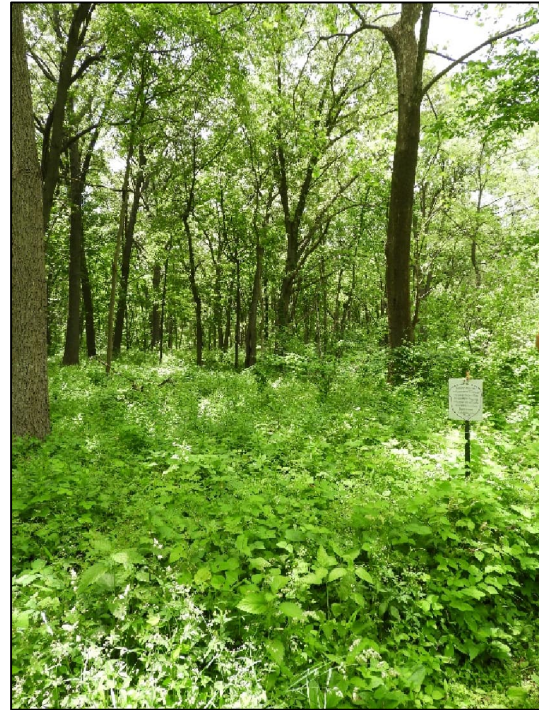


Photo 3-1: Dry – Moist Black Walnut Lowland Deciduous Forest Type (FOD7-4)

The Dry – Fresh Black Oak – Hickory Deciduous Forest has a canopy dominated by Black Oak, Black Cherry, and Pignut Hickory with a subcanopy abundant in Black Cherry and Pignut Hickory. The understory contains abundant Gray Dogwood, Herbaceous Greenbrier, and young Black Cherry. The ground cover is dominated by Wild Sarsaparilla, American Hog-peanut, Bracken Fern, Flat-topped White Aster, Interrupted Fern, and Black Snakeroot.

The dominant deciduous swamp community in Black Oak Heritage Park Area is provincially rare Swamp White Oak Mineral Deciduous Swamp (SWDM1-1). The canopy contains abundant Black Oak, Swamp White Oak, Red Maple, Pin Oak, and Bitternut Hickory. The subcanopy is comprised of Sassafras, White Mulberry, Manitoba Maple, Downy Hawthorn, and Black Cherry. The understory contains young canopy and subcanopy species, as well as native shrubs including Rough-Leaved Dogwood, Silky Dogwood, Gray Dogwood and American Hazelnut. The groundcover layer is dominated by Thicket Creeper, Poison Ivy, Wild Geranium, and a variety of native Ferns (Sensitive Fern, Royal Fern and Lady Fern).

Black Oak Heritage Park Area contains both forb-dominated and mixed meadow plant communities. The largest by area is the Dry – Fresh Mixed Meadow Ecosite (MEMM3) which contains native and non-native plant species, as indicative of historical disturbance (i.e., agriculture). Nonetheless, native species include many tallgrass prairie indicators such as Showy Tick-foil, Wild Bergamot, Foxglove Beardtongue, Flat-top White Aster and Old Field Aster.



Photo 3-2: Fresh – Moist Mixed Tallgrass Prairie Ecosite (MEMM2)

Smaller meadow areas located in the center of Black Oak Heritage Park Area and along Broadway Street have been subject to management activities by the City of Windsor to restore tallgrass prairie. In the Fresh – Moist Mixed Tallgrass Prairie Ecosites (MEMM2), dominant native grasses include Little Bluestem, Old Switch Panicgrass, Few-flowered Panicgrass, and Poverty Oatgrass. Dominant forbs include Common Milkweed, Old Field Aster, Tall Goldenrod and Riverbank Grape. There is also abundant Allegheny Blackberry, Northern Dewberry, and Black Raspberry. In moister areas, Path Rush, Purple Joe Pyeweed, Virginia Mountain-mint and Grass-leaved Goldenrod are present.

3.2.3.2 Rare Vegetation Communities

The following rare communities were identified and mapped in Black Oak Heritage Park Area. The rarity ranks for the vegetation community are in accordance with those identified by the NHIC. Black Oak Heritage Park Area contains six vegetation communities that are ranked provincially significant, including four communities that are also ranked globally significant:

- Fresh – Moist Mixed Tallgrass Prairie (MEMM2; G2/S1)
- Fresh – Moist Tallgrass Deciduous Woodland (WODM6; G1/G2; S1)
- Dry – Fresh Oak – Hickory Deciduous Forest (FODM2-2; G4?/S3S4)
- Fresh – Moist Black Walnut Lowland Deciduous Forest (FODM7-4; G4?/S2S3)
- Swamp White Oak Mineral Deciduous Swamp (SWDM1-1; G1G2/S2S3)
- Pin Oak Mineral Deciduous Swamp (SWDM1-3; G2/S2S3)

Together, these vegetation communities comprise 51.44 ha or 53.29% of the natural area (Table 3-6).

In addition to the rare plant communities above, Black Oak Heritage Park Area also contains land with other environmentally significant designations, including the provincial Black Oak Wetland Complex (PSW), Prairie Remnants (Black Oak Woods) Life ANSI, and an Environmentally Significant Area regulated by ERCA (Figure 3-4).

3.2.3.3 Significant Trees

The composition of large, old trees (>50 cm DBH) in Black Oak Heritage Park Area is presented in Table 3-7 and Figure 3-5. There are 17 species with individuals measuring >50 cm DBH. The most frequently sampled species was Black Oak (41%), followed by Eastern Cottonwood (12%) and White Oak (11%). Other Oak species, including Swamp Pin Oak, Bur Oak and Swamp White Oak, total an additional 15% of the trees sampled. In total, Oak species comprise the greatest proportion (67%) of large-diameter trees. Several Hickories are also present, including Bitternut, Pignut and Shagbark, totaling 7% of all large-diameter trees sampled. Other species were also present, but in smaller numbers (Table 3-7).

Large oaks ranged in age from 60 (Swamp Pin Oak) to 188 yrs old (Black Oak). The average age of large-diameter tree species is presented in Table 3-7 and Figure 3-6. The average age of all Oak species was >120 yrs, with exception of Black Oak (115 yrs old) and Swamp Pin Oak (82 yrs old). The oldest tree species were estimated to be the slow-growing Hickories, which averaged over 150 yrs old. Red Maple and Black Cherry trees, also relatively slow-growing species, were estimated to be >140 yrs old and 130 yrs old on average, respectively. The youngest, large tree species sampled was Eastern Cottonwood, averaging 61 yrs old.

Although Eastern Cottonwoods were some of the largest trees sampled (up to 135 cm DBH), the species is considered fast-growing and therefore a large DBH does not necessarily equate to old age, especially when compared to Oaks and Hickories. Although Eastern Cottonwoods >50 cm DBH would be considered young compared to other slow-growing species, they also tend to not live as long. The typical mortality of Eastern Cottonwood is only 60 yrs, meaning few trees live longer than this age (Loehle, 1987). As such, it is important to note that the Eastern Cottonwoods assessed in Black Oak Heritage Park Area would still be considered “old” for the species at an average of 61 yrs. Figure 3-6 provides an illustration of the average age of large tree species, including standards errors around the mean where applicable.

According to ELC methodology, ecosites or vegetation types containing trees estimated to be >120 yrs old may be considered indicative of an “old growth” community (Lee et al., 1998). In Black Oak Heritage Park Area, several of the forest and swamp communities that were sampled, including Oak – Hickory Deciduous Forest, Cottonwood Deciduous Forest, Oak Carolinian Deciduous Forest, Swamp White Oak Deciduous Swamp, and Poplar Deciduous Forest, have old growth characteristics.

Table 3-7: Composition of Large Tree Species (>50 cm DBH) Present in Black Oak Heritage Park Area

Common Name	Scientific Name	S-Rank	No. Recorded	Tree Size (cm DBH)			Estimate of Tree Age (yr)		
				Min.	Max.	Average DBH (±SE)	Min.	Max.	Average Age (±SE)
Manitoba Maple	<i>Acer negundo</i>	S5	1		75.0			59	
Red Maple	<i>Acer rubrum</i>	S5	7	50.0	96.0	80.3 (±6.5)	89	170	142 (±12)
Bitternut Hickory	<i>Carya cordiformis</i>	S5	9	50.0	95.0	62.3 (±4.4)	138	262	172 (±12)
Pignut Hickory	<i>Carya glabra</i>	S3	3	50.2	55.7	52.2 (±1.8)	148	164	154 (±5)
Shagbark Hickory	<i>Carya ovata</i>	S5	1		65.2			193	
Common Hackberry	<i>Celtis occidentalis</i>	S4	1		55.5			87	
Black Walnut	<i>Juglans nigra</i>	S4?	7	50.0	87.8	63.5 (±4.5)	89	156	113 (±8)
Sycamore	<i>Platanus occidentalis</i>	S4	2	72.0	75.0	73.5 (±1.5)	113	118	116 (±2)
Eastern Cottonwood	<i>Populus deltoides</i>	S5	24	52.0	135.0	77.5 (±4.6)	41	106	61 (±4)
Black Cherry	<i>Prunus serotina</i>	S5	5	50.5	112.0	68.3 (±11.3)	99	220	134 (±22)
White Oak	<i>Quercus alba</i>	S5	22	51.0	93.6	63.5 (±2.4)	100	184	125 (±5)
Swamp White Oak	<i>Quercus bicolor</i>	S4	7	51.8	93.7	71.8 (±5.7)	102	184	141 (±11)
Bur Oak	<i>Quercus macrocarpa</i>	S5	6	54.0	83.5	64.8 (±4.3)	106	164	128 (±8)
Swamp Pin Oak	<i>Quercus palustris</i>	S4	15	50.6	96.0	69.5 (±3.2)	60	113	82 (±4)
Black Oak	<i>Quercus velutina</i>	S4	79	51.5	119.4	73.0 (±1.5)	81	188	115 (±2)
Basswood	<i>Tilia americana</i>	S5	1		60.8			72	
American Elm	<i>Ulmus americana</i>	S5	1		57.3			90	
Total Number of Large Trees Sampled			191						

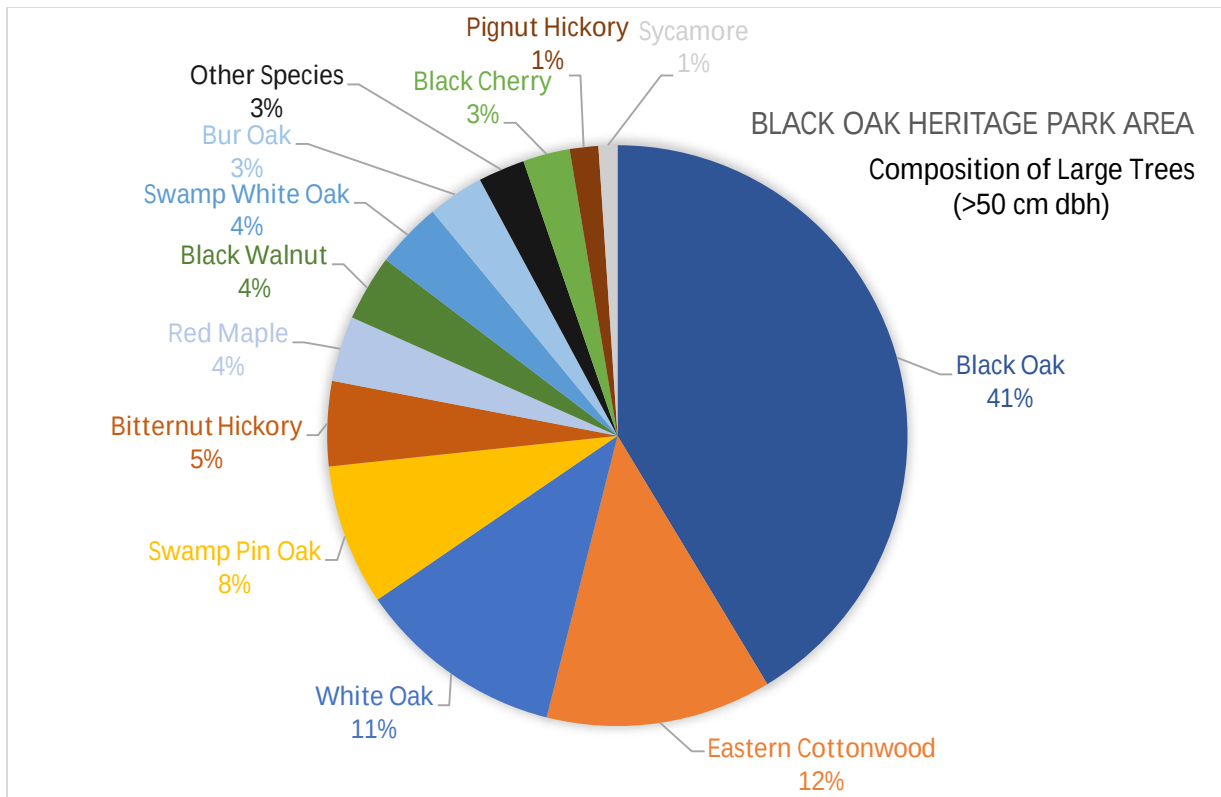


Figure 3-5: Composition of Large Tree Species (>50 cm DBH) in Black Oak Heritage Park Area

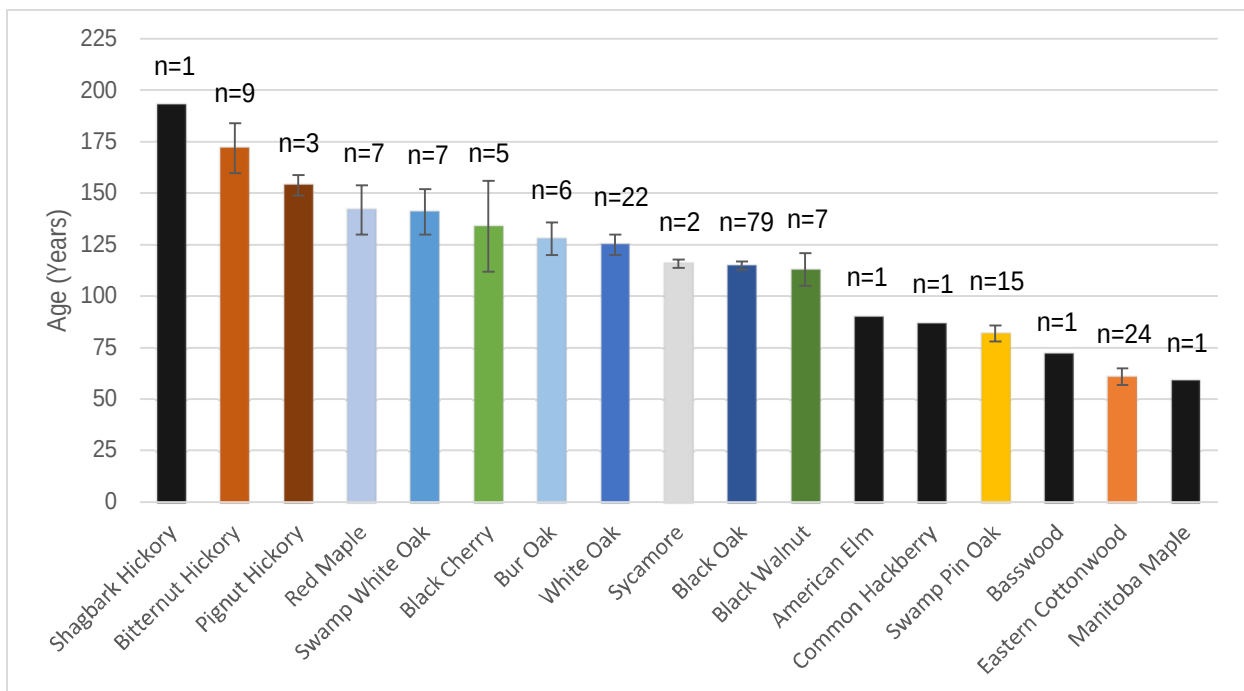


Figure 3-6: Average Age of Large Tree Species in Black Oak Heritage Park Area

3.2.3.4 Plant SAR and Provincially Rare Species

In field surveys conducted by Pratt (1979), Oldham (1983), ERCA (1992) and most recently Sage Earth (2019), there have been a total of 41 provincially rare plant species observed in Black Oak Heritage Park Area. WSP also conducted a review of sightings of rare plants from within Black Oak Heritage Park Area which identified two additional rare plants.

Altogether, a total of 43 provincially rare plant species, including eight listed as SAR have been recorded in Black Oak Heritage Park Area (Table 3-8).

In addition to the species known to occur in Black Oak Heritage Park Area, a review of secondary source information from the NHIC and rare species lists compiled for the entire Ojibway Prairie Complex indicate that many additional provincially rare species (including SAR) may occur within and/or around Black Oak Heritage Park Area where suitable habitat exists (Appendix B).

Table 3-8: Plant SAR and Provincially Rare Species Observed in Black Oak Heritage Park Area
(Removed to protect sensitive information)

3.2.3.5 Invasive Exotic Species

Many of the non-native species known to occur in Black Oak Heritage Park Area can be further characterized as invasive or aggressive species (Table 3-9; Urban Forest Associates Inc., 2002). These species, if left unchecked, have the potential to become dominant in the landscape and threaten native biodiversity. Below is a list of Category 1 to 3 invasive exotic species that are recommended for population monitoring in the site. These species are most likely to require targeted management to keep populations under control or to eradicate them entirely.

Table 3-9: Select Invasive Exotic Species in Black Oak Heritage Park Area

Common Name	Scientific Name	Category No. ¹
Manitoba Maple	<i>Acer negundo</i>	1
Norway Maple	<i>Acer platanoides</i>	2
Tree-of-heaven	<i>Ailanthus altissima</i>	2
Garlic Mustard	<i>Alliaria petiolata</i>	1
Flowering-rush	<i>Butomus umbellatus</i>	1
Spotted Knapweed	<i>Centaurea maculosa</i>	3
Canada Thistle	<i>Cirsium arvense</i>	1
Field Bindweed	<i>Convolvulus arvensis</i>	3
European Lily-of-the-valley	<i>Convallaria majalis</i>	3
Orchard Grass	<i>Dactylis glomerata</i>	3
Common Teasel	<i>Dipsacus fullonum</i>	3

Common Name	Scientific Name	Category No. ¹
Russian Olive	<i>Elaeagnus angustifolia</i>	3
Autumn Olive	<i>Elaeagnus umbellata</i>	1
Tall Ryegrass	<i>Lolium arundinaceum</i>	3
Japanese Honeysuckle	<i>Lonicera japonica</i>	1
Amur Honeysuckle	<i>Lonicera maackii</i>	1
Tartarian Honeysuckle	<i>Lonicera tatarica</i>	1
Garden Bird's-foot Trefoil	<i>Lotus corniculatus</i>	2
Purple Loosestrife	<i>Lythrum salicaria</i>	1
White Sweet Clover	<i>Melilotus alba</i>	2
Yellow Sweet Clover	<i>Melilotus officinalis</i>	2
White Mulberry	<i>Morus alba</i>	1
Eurasian Water-milfoil	<i>Myriophyllum spicatum</i>	1
Wild Parsnip	<i>Pastinaca sativa</i>	3
White Poplar	<i>Populus alba</i>	2
European Buckthorn	<i>Rhamnus cathartica</i>	1
Glossy Buckthorn	<i>Frangula alnus</i>	1
Black Locust	<i>Robinia pseudo-acacia</i>	2
Multiflora Rose	<i>Rosa multiflora</i>	1
Purple Crown-vetch	<i>Securigera varia</i>	1
Siberian Elm	<i>Ulmus pumila</i>	2
Lesser Periwinkle	<i>Vinca minor</i>	2
European Swallowwort	<i>Vincetoxicum rossicum</i>	1

Notes: ¹ Category 1 (aggressive invasive), Category 2 (highly invasive but niche-specific) and Category 3 (moderately invasive but can become locally dominant when the proper conditions exist).

3.2.4 OJIBWAY PARK AREA

Ojibway Park Area is approximately 68 ha and is located between Ojibway Parkway and Matchett Road, south of Broadway Street, and north of Sprucewood Avenue (Figure 1-1). It was the first significant natural area to be acquired by the City in 1957 (from the Canadian Salt Company). Ojibway Park is the center of activity for the larger Ojibway Prairie Complex. The property includes a Nature Centre, maintained trails for pedestrian access and passive recreational use, and a constructed pond.

WSP completed ELC vegetation community mapping on June 18-19, 2022. Results indicate the presence of 15 natural ELC Vegetation Types in nine Community Series (Table 3-10, Figure 3-5). These vegetation types represent those described in Lee et al., 1998. In addition, there are two anthropogenic Community Series, Green Lands and Transportation and Utilities, that

better represent land uses described in Lee, 2008. Based on these results, Ojibway Park Area can be described as having very high vegetation community diversity.

The ELC vegetation communities are comprised of 65.83% (44.93 ha) terrestrial habitat, 30.75% (20.98 ha) wetland habitat, 1.49% (1.02 ha) aquatic habitat and 1.93% (1.31 ha) anthropogenic land uses (Table 3-11).

Terrestrial habitat includes one herbaceous plant community series (Open Tallgrass Prairie) and four woody plant community series including Tallgrass Woodland, Deciduous Forest, Cultural Thicket, and Cultural Woodland. Wetlands include one Meadow Marsh and two Deciduous Swamp communities. The aquatic ecosystem supports one Mixed Shallow Water community. Based on the area associated with these community series, Ojibway Park Area can be characterized primarily as forest (46.79% or 31.94 ha), followed by swamp (30.63% or 20.9 ha) and tallgrass ecosystems (14.80% or 10.09 ha).

A description of the ELC vegetation communities in Ojibway Park Area is provided below. The ELC vegetation community mapping results are shown in Figure 3-7.

Table 3-10: Ojibway Park Area ELC Vegetation Community Diversity

Community Class	Community Series	ELC Code	Ecosite / Vegetation Type	G-rank	S-rank	Area (ha)	%
Tallgrass Prairie, Savannah and Woodland	Open Tallgrass Prairie	TPO1-1	Dry Tallgrass Prairie Type	G3	S1	0.11	0.17
		TPO2-1	Fresh – Moist Tallgrass Prairie Type	G2	S1	0.33	0.48
	Tallgrass Woodland	TPW1-1	Dry Black Oak – White Oak Tallgrass Woodland Type	G?	S1	5.48	8.03
		TPW2-1	Fresh – Moist Black Oak – White Oak Tallgrass Woodland Type	G2	S1	1.32	1.94
		TWP2-2	Fresh – Moist Pin Oak Tallgrass Woodland Type	G1	S1	2.85	4.18
Forest	Deciduous Forest	FOD1-3	Dry – Fresh Black Oak Deciduous Forest Type	G4?	S3	20.85	30.54
		FOD3-1	Dry – Fresh Poplar Deciduous Forest Type			0.56	0.82
		FOD9-2	Fresh – Moist Oak – Maple Deciduous Forest Type			10.53	15.43

Community Class	Community Series	ELC Code	Ecosite / Vegetation Type	G-rank	S-rank	Area (ha)	%
Cultural	Cultural Thicket	CUT1	Mineral Cultural Thicket Ecosite			2.16	3.16
	Cultural Thicket/ Cultural Woodland	CUT1-4 /CUW1	Gray Dogwood Cultural Thicket Type / Mineral Cultural Woodland Ecosite			0.51	0.74
	Cultural Woodland	CUW1	Mineral Cultural Woodland Ecosite			0.23	0.34
Swamp	Deciduous Swamp	SWD1-3	Pin Oak Mineral Deciduous Swamp Type	G2	S2S3	13.15	19.27
		SWD1-3 /SWD3-2	Pin Oak Mineral Deciduous Swamp Type / Silver Maple Mineral Deciduous Swamp Type			7.75	11.36
Marsh	Meadow Marsh	MAM2	Mineral Meadow Marsh Ecosite			0.08	0.12
Shallow Water	Mixed Shallow Aquatic	SAM1-6	Bladderwort Mixed Shallow Aquatic Type			1.02	1.49
Constructed*	Green Lands	CGL-2	Parkland			0.72	1.06
	Transportation and Utilities	CVI-1	Transportation			0.59	0.87
Total						68.24	100

Notes: * Indicates an anthropogenic community series as described in Lee, 2008.

Table 3-11: Ojibway Park Area ELC Community Class Statistics

ELC Community Class	Area (ha)	Proportion (%)
Terrestrial	44.93	65.83
Tallgrass Prairie, Savannah and Woodland	10.09	14.80
Forest	31.94	46.79
Cultural	2.90	4.24
Wetland	20.98	30.75
Swamp	20.90	30.63
Marsh	0.08	0.12
Aquatic	1.02	1.49
Shallow Water	1.02	1.49
Anthropogenic	1.31	1.93
Constructed	1.31	1.93
Total	68.24	100

3.2.4.1 ELC Community Descriptions

There are three different types of deciduous forest communities present in Ojibway Park Area. The largest by area is the provincially rare Dry – Fresh Black Oak Deciduous Forest (FOD1-3), followed by Fresh – Moist Oak – Maple Deciduous Forest (FOD9-2).

The Dry – Fresh Black Oak Deciduous Forest has a canopy dominated by Black Oak with occasional Silver Maple, Swamp Pin Oak, White Oak, Pignut Hickory and Black Gum (>25 m in height; >60% cover). Black Cherry is the dominant species in the subcanopy with regenerating Black Oak, Silver Maple, and Pignut Hickory (10-25 cm in height; 25-60% cover). The understory contains a variety of native shrubs and small trees including Grey Dogwood, American Witch-hazel, American Hazelnut and Common Prickly-ash (2-10 m in height; 25-60% cover). In the understory, Virginia Creeper and Bracken Fern are abundant, Spotted Geranium and Pennsylvania Sedge are observed occasionally, and Royal Fern is uncommon (0.2 – 0.5 m in height; >60% cover).



Photo 3-3: Dry – Fresh Black Oak Deciduous Forest (FOD1-3)

This Black Oak deciduous forest community is estimated to be mature based on the size and composition of the tree species. According to ELC methodology, a mature-aged forest is dominated by species that are replacing themselves and are likely to remain an important component of the community if it is not disturbed. The presence of many large (>50 cm DBH) Black Oak, Black Cherry and Maple species in the canopy and regenerating individuals in lower vegetation strata supports this designation. Fallen logs and potential wildlife hibernacula are common throughout.

The soil analysis characteristics indicate this community has a mineral soil substrate of dry to moderately fresh sandy loam. The depth of the organic layer is 1 cm and there are no mottles or gleys. Depth to bedrock is >120 cm.

The other dominant forest type in Ojibway Park Area is a Fresh – Moist Oak – Maple Deciduous Forest. This community has a diverse canopy dominated by Swamp Pin Oak and abundant Freeman's Maple, with occasional Silver Maple, Red Maple, Black Oak, White Oak, and Swamp White Oak (>25 m in height; >60% cover). The subcanopy is primarily Black Cherry and regenerating Maples (10-25 m in height; 25-60% cover). The understory contains small Black Cherry and native Grey Dogwood and Blackberry (*Rubus* sp.) shrubs (2-10 m in height; 25-60% cover). The understory is dense and dominated by native species including Clustered Sanicle, Virginia Creeper, Spotted Geranium, Royal Fern and May-apple.

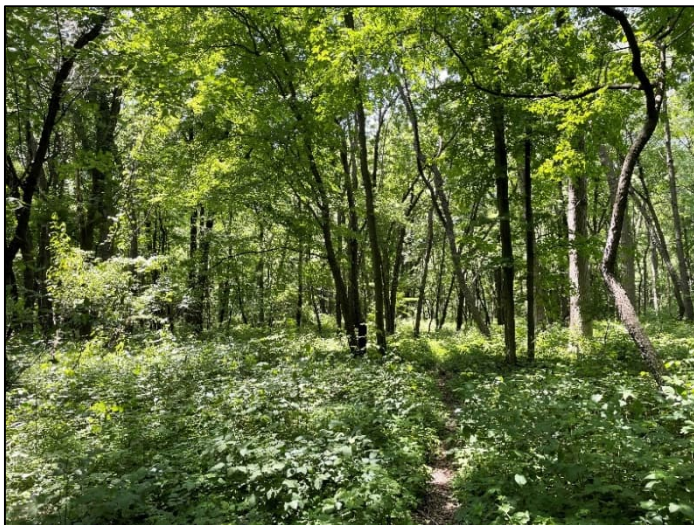


Photo 3-4: Fresh – Moist Oak – Maple Deciduous Forest (FOD9-2)

This Oak – Maple deciduous forest is estimated to be mature based on the size and composition of the tree species. Many large (>50 cm DBH) Oak and Maple species are present in the canopy and regenerating individuals are present in the lower vegetation layers. It is a high-quality site with vernal pools, fallen logs, snags and potential hibernacula. The soil analysis characteristics indicate this community has a mineral soil substrate of moderately fresh sandy loam. The depth of the organic layer is 1 cm and there are no mottles or gleys. Depth to bedrock is >120 cm.

The largest deciduous swamp type comprising Ojibway Park Area is Pin Oak Mineral Deciduous Swamp (SWD1-3). This swamp community has a canopy dominated by Swamp Pin Oak, Silver Maple, Red Maple, and Swamp White Oak (>25 m in height; >60% cover). The subcanopy is comprised of smaller canopy species, with the addition of Black Cherry, Red Ash, and occasional White Mulberry (10-25 m in height; 25-60% cover). The understory is dominated by native shrubs and small trees, including Eastern Buttonbush, Grey Dogwood, Common Prickly-Ash, American Hazelnut and Red Ash (2-10 m in height; 10-25% or 25-60% cover depending on location). Ferns and Sedges comprise a majority of the groundcover layer (0.2-0.5 m in height; >60% cover).



Photo 3-5: Pin Oak Mineral Deciduous Swamp (SWD1-3)

The swamp community in Ojibway Park Area is estimated to be mature based on the size and composition of the tree species. It is a high-quality site with vernal pools, fallen logs, snags and potential hibernacula. The soil analysis characteristics indicate this community has a mineral soil substrate of very moist to moist-moderately moist sandy loam. The depth of the organic layer ranged from 1-4 cm depending on location and the depth to mottles is 50 cm (no gleys observed). Depth to bedrock is >120 cm.

Ojibway Park Area has five remnant tallgrass prairie and woodland community types, the most of any natural area in the Ojibway Prairie Complex. The largest communities by area are the tallgrass woodlands, which differ primarily due to soil moisture conditions. These are Dry Black Oak – White Oak Tallgrass Woodland (TPW1-1), Fresh – Moist Black Oak – White Oak Tallgrass Woodland (TPW2-1) and Fresh – Moist Pin Oak Tallgrass Woodland (TPW2-2).

The Dry Black Oak – White Oak Tallgrass Woodland has a canopy dominated by mature Black Oak and occasional White Oak. Other occasional species include Silver Maple and Pignut Hickory (>25 m in height; >60% cover). The subcanopy is relatively open and primarily comprised of Black Oak, with Black Cherry, White Oak and occasional Black Walnut present (10-25 m in height; 10-25% cover). The understory contains regenerating Black Oak and Black Cherry, with lesser amounts of Red Ash and Blackberry species (2-10 m in height; 10-25% cover).

The groundcover layer is dominated by Pennsylvania Sedge, Bracken Fern and herbaceous flowering plants including Goldenrods, Canada Anemone, and Four-flowered Yellow Loosestrife (≤1 m in height; >60% cover).

This woodland community is estimated to be old growth based on the size and composition of the tree species. According to ELC methodology (1998), an old growth woodland is described as a self-perpetuating community comprised primarily of late seral species that show uneven stand age distribution including large old trees (generally >120 yrs) without open-grown characteristics. The dominance of Black Oak in the vegetation layers, as well as the presence of many large (>50 cm DBH), old Black Oaks and White Oaks supports this designation. Wildlife features in the form of fallen logs and potential hibernacula are common throughout. It was also noted that some portions of this community were succeeding to a deciduous forest.



Photo 3-6: Dry Black Oak – White Oak Tallgrass Woodland (TPW1-1)

The soil analysis characteristics indicate this community has a mineral soil substrate of dry-moderately fresh loamy sand. The depth of the organic layer is 1 cm and there are no mottles or gleys. Depth to bedrock is >120 cm.

The Fresh – Moist Black Oak – White Oak Tallgrass Woodland is located in the center of the park. Oak species dominate the canopy of this community, particularly Black Oak followed by Swamp White Oak and Pin Oak (>25 m in height; 25-60% cover). The subcanopy and understory are relatively open (10-25% cover) with occasional Black Cherry and Freeman's' Maple (10-25 m in height), Blackberry species, American Hazelnut and White Mulberry (2-10 m in height). Flat-top White Aster is abundant in the groundcover layer with occasional Virginia Smartweed, Rough-fruit Corn Bedstraw, Purple Joe Pye Weed and cool-season grasses (≤1 m in height; >60 cm cover).

This woodland community is estimated to be old growth based on the size and composition of the tree species. The canopy trees are primarily large, mature Oaks. Fallen logs and potential wildlife hibernacula are common throughout. The soil analysis characteristics indicate this community has a mineral soil substrate of dry-fresh sandy loam. The depth of the organic layer is 1 cm and there are no mottles or gleys. Depth to bedrock is >120 cm.

The Fresh – Moist Pin Oak Tallgrass Woodland has a canopy mainly dominated by large Swamp Pin Oaks with lesser cover of Freeman's Maple and Eastern Cottonwood. The occasional Black Oak is also present (>25 m in height; 25-60% cover). The subcanopy and understory are sparse in locations, with Freeman's Maple, Black Cherry, and Red Ash present (10-25 cm in height; 10-25% cover) as well as Dogwoods (*Cornus* sp.), Blackberry species and small trees (2-10 m in height; 10-25% cover). Common groundcover species include Goldenrods and Sedges, Bracken Fern, and Royal Fern (≤ 1 m in height; >60% cover).



Photo 3-7: Fresh – Moist Pin Oak Tallgrass Woodland (TPW2-2)

This woodland community is estimated to be old growth based on the size and composition of the tree species. Vernal pools, fallen logs and potential wildlife hibernacula are common throughout. The soil analysis characteristics indicate this community has a mineral soil substrate of fresh loamy sand. The depth of the organic layer is 1 cm. The depth to mottles is 70 cm (no gleys observed). Depth to bedrock is >120 cm.

The remnant Open Tallgrass Prairie communities in Ojibway Park Area are small by area but remain ecologically significant in that they provide habitat for many rare and endangered species. The Ojibway Park Area contains both Dry and Fresh – Moist Tallgrass Prairie (TPO1-1 and TPO2-1) community types.



Photo 3-8: Dry Tallgrass Prairie Type (TPO1-1)

The Dry Tallgrass Prairie contains a mix of grasses and forbs such as Big Bluestem, Little Bluestem, Round-headed Bush-clover, Black-eyed Susan and Milkweed species (*Asclepias* sp.) (≤ 1 m in height; >60% cover). The soil analysis characteristics indicate this community has a mineral soil substrate of dry loamy sand. There is no organic layer, mottles or gleys. The depth to bedrock is >120 cm.

It was noted that this community is surrounded by Black Oak-dominated forest.

The Fresh – Moist Tallgrass Prairie also contains a mix of grasses and forbs including Big Bluestem, Yellow Indiangrass, Tall Boneset, Virginia Mountain-mint, Wild Bergamot, and Tall Goldenrod (≤ 1 m in height; $>60\%$ cover).

The soil in this community is characterized as a mineral fresh sandy loam. The depth of the organic layer is 1 cm and the depth to mottles is 40 cm. Depth to bedrock is >120 cm.



Photo 3-9: Fresh – Moist Tallgrass Prairie Type (TPO2-1)

The remaining plant communities that comprise Ojibway Park are small in area and/or comprised of cultural ecosites. The man-made pond to the north of Ojibway Nature Centre and the large drain that runs adjacent to Matchett Road are described as a Bladderwort Mixed Shallow Aquatic (SAM1-6) community.

The open water features are dominated by Common Bladderwort with other species such as Water-milfoil, Small Duckweed, Fragrant Waterlily and Bullrush species (*Scirpus* sp.) around the edges. Fallen logs offer basking sites for reptiles. Fish, turtles and amphibians are abundant in these areas.

Immediately adjacent to the pond and drain are Dry – Fresh Poplar Deciduous Forest (FOD3-1) and successional Mineral Cultural Thicket (CUT1) ecosites.



Photo 3-10: Bladderwort Mixed Shallow Aquatic (SAM1-6) and Dry – Fresh Poplar Deciduous Forest (FOD3-1)

In the deciduous forest, Eastern Cottonwood dominates the canopy with an occasional Swamp Pin Oak present (>25 m in height; $>60\%$ cover). Black Walnut, White Mulberry and Black Cherry are present in equal amounts in the sub-canopy (10-25 m in height; $>60\%$ cover). The understory is quite dense with abundant Black Cherry and Red Ash, and the occasional Sumac (*Rhus* sp.), Multiflora Rose and Hawthorn species (*Crataegus* sp.) (2-10 m in height; $>60\%$ cover).

The groundcover layer is a mix of cool-season grasses, Goldenrods and woody vines (≤ 1 m in height; 10-25% cover). This forest is considered mid-aged and successional given the size and composition of the tree species. The soil is characterized as a dry-moderately dry sand (the soil was used to construct a berm around pond). The depth of the organic layer is 1 cm and there are no mottles or gleys. Depth to bedrock is >120 cm.

The Mineral Cultural Thicket (CUT1) ecosite consists of areas dominated by Grey Dogwood and Rough-leaved Dogwood in the understory layer. Other shrubs and small trees include White Mulberry, Red Ash, Honeysuckle (*Lonicera* sp.), Blackberries (*Rubus* sp.) and Sumac (2-10 m in height; $>60\%$ cover). In areas succeeding to cultural woodland, Eastern Cottonwood, Silver Maple and Black Cherry are present in the canopy (>25 m in height; 25-60%) and sub-canopy (10-25 m in height; 10-25% cover) layers. Groundcover is difficult to see in certain areas due to the dense understory, but appears to be dominated by Virginia Creeper, Spotted Geranium and Poison Ivy (<1 m in height; 25-60% cover depending on location). This community is considered young according to the ELC methodology, i.e. has not yet undergone natural thinning and plants grow as individuals rather than interrelated members of the plant community. The soil analysis characteristics indicate this community has a mineral soil substrate of moderately fresh loamy sand and sandy loam. The depth of the organic layer is 1 cm and there are no mottles or gleys. Depth to bedrock is >120 cm.

3.2.4.2 Rare Vegetation Communities

The following rare communities were identified and mapped in Ojibway Park Area. The rarity ranks for the vegetation community are in accordance with those identified by the NHIC. Ojibway Park Area contains seven vegetation communities that are ranked provincially significant, including six communities that are also ranked globally significant:

- Dry Tallgrass Prairie Type (TPO1-1; G3/S1)
- Fresh – Moist Tallgrass Prairie Type (TPO2-1; G2/S1)
- Dry Black Oak – White Oak Tallgrass Woodland Type (TPW1-1; G?/S1)
- Fresh – Moist Black Oak – White Oak Tallgrass Woodland Type (TPW2-1; G2/S1)
- Fresh – Moist Pin Oak Tallgrass Woodland Type (TPW2-2; G1/S1)
- Dry – Fresh Black Oak Deciduous Forest Type (FOD1-3; G4?/S3)
- Pin Oak Mineral Deciduous Swamp Type (SWD1-3; G2/S2S3)

Together, these vegetation communities comprise 44.09 ha or 64.61% of the natural area (Table 3-10).

In addition to the rare plant communities above, Ojibway Park Area also contains land with other environmentally significant designations, including the provincial Prairie Remnants (Ojibway Park) Life ANSI and an Environmentally Significant Area regulated by ERCA (Figure 3-8).



LEGEND

NATURAL HERITAGE REVIEW BOUNDARY

REGULATION AREA (ESSEX REGION CONSERVATION AUTHORITY)

ENVIRONMENTALLY SIGNIFICANT AREA

LIFE ANSI (LAND INFORMATION ONTARIO, 2021)

MUNICIPAL DRAIN

OVERHEAD UTILITY LINE/UTILITY CORRIDOR

RAILWAY



REFERENCE(S)
COUNTY OF ESSEX, IMAGERY SERVICE: COUNTY 2022 AIRPHOTO, COUNTY 2021 AIRPHOTOMAP DATA © OPENSTREETMAP CONTRIBUTORS, MICROSOFT, FACEBOOK, INC. AND ITS AFFILIATES, ESRI COMMUNITY MAPS CONTRIBUTORS, MAP LAYER BY ESRI. LAND INFORMATION ONTARIO.
CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE – ONTARIO, CANADA.
PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N.

CLIENT

PROJECT
PROPOSED NATIONAL URBAN PARK IN WINDSOR
OJIBWAY PRAIRIE COMPLEX
NATURAL HERITAGE REVIEW REPORT

TITLE
DESKTOP NATURAL HERITAGE REVIEW
OJIBWAY PARK AREA

CONSULTANT	YYYY-MM-DD	2024-02-22
DESIGNED	SS	
PREPARED	HB	
REVIEWED		
APPROVED		



3.2.4.3 Significant Trees

The composition of large, old trees (>50 cm DBH) in Ojibway Park Area is presented in Table 3-12 and Figure 3-9. There are 14 species with individuals measuring over 50 cm DBH. The most frequently sampled species was Black Oak (36%), followed by Swamp Pin Oak (28%) and Red Maple (10%). Large Swamp White Oak, White Oak and Northern Red Oak were also present, comprising an additional 9% of the trees sampled. In total, Oak species comprised the greatest proportion (73%) of large-diameter trees, followed by Maples (16%) and Black Cherry (5%). Other species were also present, but in smaller numbers (Table 3-12, Figure 3-9).

Large Oaks ranged in age from approximately 59 (Swamp Pin Oak) to >180 yrs old (White Oak). The average age of large-diameter tree species is presented in Table 3-12 and Figure 3-10. The oldest tree species on average was White Oak (averaging 163 yrs old), followed by Pignut Hickory (158 yrs), Swamp White Oak (130 yrs), Red Maple (123 yrs) and Black Cherry (120 yrs). The youngest, large tree species sampled was Eastern Cottonwood, averaging 53 yrs old. Similar to the Eastern Cottonwood recorded in other natural areas, the large individuals in Ojibway Park Area would also be considered “old” for the species given the typical mortality of 60 yrs.

The large trees sampled are present within each of the forest and woodland communities in the Ojibway Park Area, including Black Oak Deciduous Forest, Black Oak – White Oak Tallgrass Woodland, Oak – Maple Deciduous Forest and Pin Oak Swamp.

Table 3-12: Composition of Large Tree Species (>50 cm DBH) Present in Ojibway Park Area

Common Name	Scientific Name	S-Rank	No. Recorded	Tree Size (cm DBH)			Estimate of Tree Age (yr)		
				Min.	Max.	Average DBH (±SE)	Min.	Max.	Average Age (±SE)
Red Maple	<i>Acer rubrum</i>	S5	16	50.0	107.0	69.3 (±4.1)	89	190	123 (±7)
Silver Maple	<i>Acer saccharinum</i>	S5	9	50.5	96.5	70.8 (±5.4)	60	114	84 (±6)
Pignut Hickory	<i>Carya glabra</i>	S3	3	50.0	57.8	53.5 (±2.3)	148	171	158 (±7)
Black Gum	<i>Nyssa sylvatica</i>	S3	1		41.0			81	
Sycamore	<i>Platanus occidentalis</i>	S4	1		63.6			100	
Eastern Cottonwood	<i>Populus deltoides</i>	S5	3	56.0	90.5	67.8 (±11.3)	44	71	53 (±9)
Black Cherry	<i>Prunus serotina</i>	S5	8	51.0	73.5	60.9 (±2.8)	100	145	120 (±5)
White Oak	<i>Quercus alba</i>	S5	4	69.0	92.2	82.7 (±5.4)	136	181	163 (±11)
Swamp White Oak	<i>Quercus bicolor</i>	S4	10	50.7	88.5	65.8 (±4.2)	100	174	130 (±8)
Swamp Pin Oak	<i>Quercus palustris</i>	S4	47	50.0	95.4	66.8 (±1.5)	59	113	79 (±2)
Northern Red Oak	<i>Quercus rubra</i>	S5	2	60.0	87.5	73.8 (±13.8)	94	138	116 (±22)
Black Oak	<i>Quercus velutina</i>	S4	60	50.0	109.3	70.7 (±1.6)	79	179	111 (±2)
Sassafras	<i>Sassafras albidum</i>	S4	1		51.8			82	
American Elm	<i>Ulmus americana</i>	S5	1		55.5			87	
Total Number of Large Trees Sampled			166						

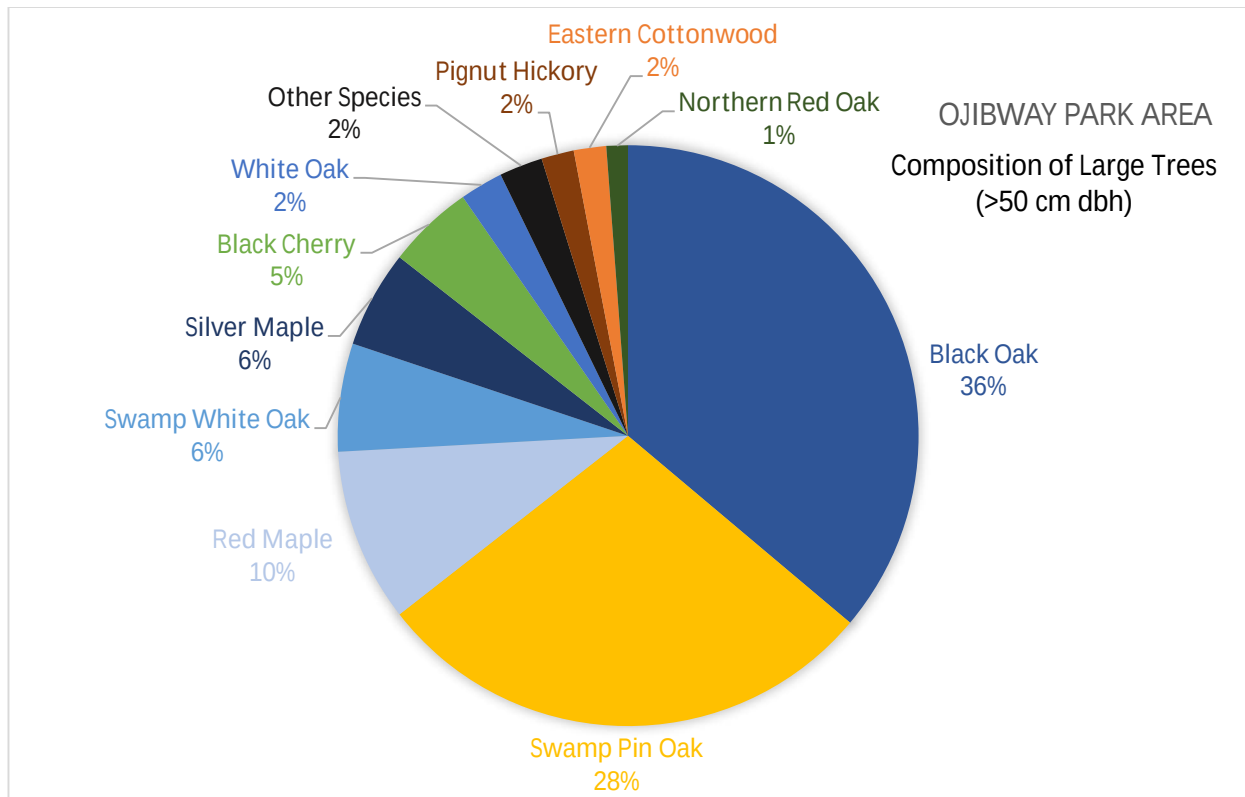


Figure 3-9: Composition of Large Tree Species (>50 cm DBH) in Ojibway Park Area

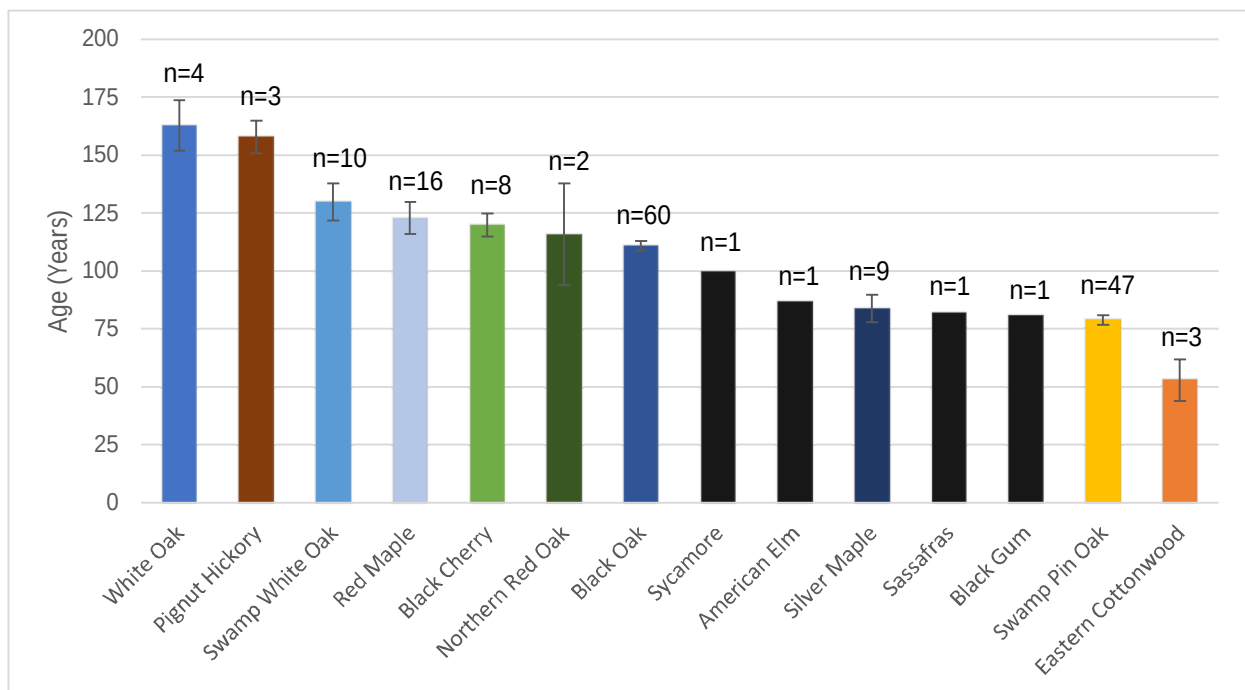


Figure 3-10: Average Age of Large Tree Species in Ojibway Park Area

3.2.4.4 Plant SAR and Provincially Rare Species

WSP completed a desktop review of rare species observations in the Ojibway Park Area recorded by Pratt (1979) and Ojibway Nature Centre staff, as well as verified and research grade sightings of rare plants posted to iNaturalist. In addition, WSP conducted field surveys in summer 2021 and 2022 in known SAR locations and potentially suitable habitat. All incidental observations of SAR and rare plants were recorded during these surveys.

A total of 38 provincially rare plant species have been observed in Ojibway Park Area, including nine listed as SAR.

In addition to the species known to occur in Ojibway Park Area, a review of secondary source information from the NHIC and rare species lists compiled for the entire Ojibway Prairie Complex indicate many additional provincially rare species (including SAR) may occur within and/or around the Ojibway Park Area where suitable habitat exists (Appendix B).

Table 3-13: Plant SAR and Provincially Rare Species Observed in Ojibway Park Area

(Removed to protect sensitive information)

3.2.4.5 Invasive Exotic Species

Many of the non-native species known to occur in Ojibway Park Area can be further characterized as invasive or aggressive species (Table 3-14; Urban Forest Associates Inc., 2002). These species, if left unchecked, have the potential to become dominant in the landscape and threaten native biodiversity. Below is a list of Category 1 to 3 invasive exotic species that are recommended for population monitoring in the site. These species are most likely to require targeted management to keep populations under control or to eradicate them entirely.

Table 3-14: Select Invasive Exotic Species in Ojibway Park Area

Common Name	Scientific Name	Category No. ¹
Tree-of-heaven	<i>Ailanthus altissima</i>	2
Manitoba Maple	<i>Acer negundo</i>	1
Garlic Mustard	<i>Alliaria petiolata</i>	1
Spotted Knapweed	<i>Centaurea maculosa</i>	3
Canada Thistle	<i>Cirsium arvense</i>	1
Orchard Grass	<i>Dactylis glomerata</i>	3
Common Teasel	<i>Dipsacus fullonum</i>	3
Autumn Olive	<i>Elaeagnus umbellata</i>	1
Honeysuckle species	<i>Lonicera</i> sp.	1
Purple Loosestrife	<i>Lythrum salicaria</i>	1
White Mulberry	<i>Morus alba</i>	1

Common Name	Scientific Name	Category No. ¹
Wild Parsnip	<i>Pastinaca sativa</i>	3
European Reed	<i>Phragmites australis</i> <i>ssp. australis</i>	1
Japanese Knotweed	<i>Reynoutria japonica</i>	2
Multiflora Rose	<i>Rosa multiflora</i>	1
Black Locust	<i>Robinia pseudoacacia</i>	1
Purple Crown-vetch	<i>Securigera varia</i>	1
Siberian Elm	<i>Ulmus pumila</i>	2

Notes:¹ Category 1 (aggressive invasive); Category 2 (highly invasive but niche-specific); and Category 3 (moderately invasive but can become locally dominant when the proper conditions exist).

3.2.5 TALLGRASS PRAIRIE HERITAGE PARK AREA

Tallgrass Prairie Heritage Park Area is approximately 57 ha and is located between Matchett Road and Malden Road, south of Armada Street and north of the Ojibway Prairie Provincial Nature Reserve Area (Figure 1-1). The City acquired a significant portion of the park area in 1990 as a cooperative natural heritage protection project with financial assistance from numerous stakeholders. The property includes constructed ponds and maintained trails for pedestrian access and passive recreational use.

In past Candidate Natural Heritage Site evaluations conducted by ERCA (1992 and 2008) and the City of Windsor's Environmental Evaluation Report (2001), Tallgrass Prairie Heritage Park Area was described as having significant areas of sensitive tallgrass prairie, savannah, meadow marsh and woodland habitat, supporting over 100 plant species with significant conservation designations. Many rare wildlife species, including reptiles and insects, were observed on the property. At the time, Tallgrass Prairie Heritage Park Area ranked the highest in diversity of all the natural heritage sites assessed by ERCA (2008).

WSP completed recent ELC vegetation community mapping on June 10, 13 and 17, 2022. Results indicate the presence of 19 natural ELC Vegetation Types in 12 Community Series (Table 3-15, Figure 3-8). These vegetation types represent those described in Lee et al., 1998. Based on these results, the Tallgrass Prairie Heritage Park Area can be described as having very high vegetation community diversity.

The ELC vegetation communities in Tallgrass Prairie Heritage Park Area are comprised of 75.08% (43.12 ha) terrestrial habitat, 15.32% (8.80 ha) wetland habitat and 2.42% (1.39 ha) aquatic habitat (Table 3-16). In addition, there are transitional habitats comprising both terrestrial and wetland community characteristics (7.17% or 4.12 ha). In these areas, microtopographic variation results in a mosaic pattern of low-lying depressions with wetland characteristics and raised areas with upland/terrestrial characteristics. This variation could not be teased apart into separate community types.

Terrestrial habitat is comprised of two herbaceous plant community series (Open Tallgrass Prairie and Cultural Meadow) and four woody plant community series including Tallgrass

Woodland, Deciduous Forest, Cultural Thicket and Cultural Woodland. Wetlands are comprised of Deciduous Swamp and Thicket Swamp communities. The aquatic ecosystem supports a Floating-leaved Shallow Aquatic community. Based on the area associated with these communities, Tallgrass Prairie Heritage Park Area can be characterized primarily as forest (41.49% or 23.83 ha), followed by cultural habitats (24.74% or 14.21 ha), swamp (15.32% or 8.80 ha) and tallgrass ecosystems (8.85% or 5.08 ha).

A description of the dominant ELC vegetation communities in the Tallgrass Prairie Heritage Park Area is provided below. The ELC vegetation community mapping results are shown in Figure 3-11.

Table 3-15: Tallgrass Prairie Heritage Park Area ELC Vegetation Community Diversity

Community Class	Community Series	ELC Code	Ecosite / Vegetation Type	G-rank	S-rank	Area (ha)	%
Tallgrass Prairie, Savannah and Woodland	Open Tallgrass Prairie	TPO2-1	Fresh – Moist Tallgrass Prairie Type	G2	S1	0.66	1.14
	Tallgrass Woodland	TPW1-1	Dry Black Oak – White Oak Tallgrass Woodland Type	G?	S1	4.42	7.70
Cultural	Cultural Meadow	CUM1	Mineral Cultural Meadow Ecosite			2.07	3.60
		CUM1-1	Dry – Moist Old Field Meadow Type			1.41	2.46
		CUM1-1/ TPO2-1	Dry – Moist Old Field Meadow Type / Fresh – Moist Tallgrass Prairie Type			0.61	1.07
	Cultural Thicket	CUT1	Mineral Cultural Thicket Ecosite			0.94	1.64
	Cultural Woodland	CUW1	Mineral Cultural Woodland Ecosite			4.04	7.04
	Cultural Meadow/ Cultural Thicket	CUM1-1/ CUT1	Dry – Moist Old Field Meadow Type / Mineral Cultural Thicket			5.13	8.94
Forest	Deciduous Forest	FOD1	Dry – Fresh Oak Deciduous Forest Ecosite			1.07	1.86

Community Class	Community Series	ELC Code	Ecosite / Vegetation Type	G-rank	S-rank	Area (ha)	%
Forest	Deciduous Forest	FOD1-3	Dry – Fresh Black Oak Deciduous Forest Type	G4?	S3	9.29	16.18
		FOD8-1	Fresh – Moist Poplar Deciduous Forest Type			12.83	22.35
		FOD9	Fresh – Moist Oak – Maple – Hickory Deciduous Forest Ecosite			0.64	1.12
Swamp	Deciduous Swamp	SWD1	Oak Mineral Deciduous Swamp Ecosite			3.59	6.26
		SWD1-3	Pin Oak Mineral Deciduous Swamp Type	G2	S2S3	3.40	5.93
		SWD4-5	Poplar Mineral Deciduous Swamp Type			1.08	1.87
	Thicket Swamp	SWT2	Mineral Thicket Swamp Ecosite			0.73	1.27
Shallow Water	Floating-leaved Shallow Aquatic	SAF1-3	Duckweed Floating – leaved Shallow Aquatic			1.39	2.42
Transitional (Terrestrial/ Wetland)	Open Tallgrass Prairie /Deciduous Swamp	TPO2-1 /SWD1	Fresh – Moist Tallgrass Prairie Type / Oak Mineral Deciduous Swamp Ecosite			1.71	2.98
	Deciduous Swamp/ Deciduous Forest	SWD/ FOD8-1	Deciduous Swamp / Fresh – Moist Poplar Deciduous Forest Type			2.41	4.20
Total						57.43	100



LEGEND

- NATURAL HERITAGE REVIEW BOUNDARY
- ELC VEGETATION COMMUNITY BOUNDARY
- MUNICIPAL DRAIN
- OVERHEAD UTILITY LINE/UTILITY CORRIDOR

ELC CODE	ELC DESCRIPTION
CUM1	MINERAL CULTURAL MEADOW ECOSITE
CUM1-1	DRY - MOIST OLD FIELD MEADOW TYPE
CUT1	MINERAL CULTURAL THICKET ECOSITE
CUW1	MINERAL CULTURAL WOODLAND ECOSITE
FOD1	DRY - FRESH OAK DECIDUOUS FOREST ECOSITE
FOD1-3	DRY - FRESH BLACK OAK DECIDUOUS FOREST TYPE
FOD8-1	FRESH - MOIST POPLAR DECIDUOUS FOREST TYPE
FOD9	FRESH - MOIST OAK - MAPLE - HICKORY DECIDUOUS FOREST ECOSITE
SAF1-3	DUCKWEED FLOATING-LEAVED SHALLOW AQUATIC TYPE
SWD	DECIDUOUS SWAMP
SWD1	OAK MINERAL DECIDUOUS SWAMP ECOSITE
SWD1-3	PIN OAK MINERAL DECIDUOUS SWAMP TYPE
SWD4-5	POPLAR MINERAL DECIDUOUS SWAMP TYPE
SWT2	MINERAL THICKET SWAMP ECOSITE
TPO2-1	FRESH - MOIST TALLGRASS PRAIRIE TYPE
TPW1-1	DRY BLACK OAK - WHITE OAK TALLGRASS WOODLAND TYPE

0 90 180

1:4,500 METRES

REFERENCE(S)
COUNTY OF ESSEX, IMAGERY SERVICE: COUNTY 2022 AIRPHOTO, COUNTY 2021 AIRPHOTOMAP DATA © OPENSTREETMAP CONTRIBUTORS, MICROSOFT, FACEBOOK, INC. AND ITS AFFILIATES, ESRI COMMUNITY MAPS CONTRIBUTORS, MAP LAYER BY ESRI. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE – ONTARIO, CANADA.
PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N.

CLIENT
THE CITY OF WINDSOR
ONTARIO, CANADA

PROJECT
PROPOSED NATIONAL URBAN PARK IN WINDSOR
OJIBWAY PRAIRIE COMPLEX
NATURAL HERITAGE REVIEW REPORT

TITLE
2022 ELC VEGETATION COMMUNITY MAPPING
TALLGRASS PRAIRIE HERITAGE PARK AREA

CONSULTANT	YYYY-MM-DD	2024-02-22
DESIGNED	SS	
PREPARED	HB	
REVIEWED		
APPROVED		

PROJECT NO. CONTROL

IM22104012

REV. E

FIGURE 3-11

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B 25mm

Table 3-16: Tallgrass Prairie Heritage Park Area ELC Community Class Statistics

ELC Community Class	Area (ha)	Proportion (%)
Terrestrial	43.12	75.08
Tallgrass Prairie, Savannah and Woodland	5.08	8.85
Forest	23.83	41.49
Cultural	14.21	24.74
Wetland	8.80	15.32
Swamp	8.80	15.32
Aquatic	1.39	2.42
Shallow Water	1.39	2.42
Transitional (Terrestrial/Wetland)	4.12	7.18
Tallgrass Prairie/Swamp	1.71	2.98
Swamp/Forest	2.41	4.20
Total	57.43	100

3.2.5.1 ELC Community Descriptions

The two largest deciduous forest communities by area in the Tallgrass Prairie Heritage Park Area are the Dry – Fresh Black Oak Deciduous Forest (FOD1-3) and Fresh – Moist Poplar Deciduous Forest (FOD8-1).

The Dry – Fresh Black Oak Deciduous Forest is a provincially rare community. It is characterized by a canopy of Oak species. Black Oak is dominant but White Oak, Swamp White Oak, Swamp Pin Oak and the occasional Pignut Hickory are also present (>25 m in height; >60% cover). The subcanopy is comprised of the same Oak species, as well as Black Cherry, Sassafras and Black Locust (10-25 m in height; 10-25% to 25-60% cover depending on location). Where the understory contains small trees such as Black Cherry, Sassafras and Red Ash, cover is relatively open (2-10 m in height; 0-10% or 10-25% depending on location). Where the understory contains Grey Dogwood, American Hazelnut and Multiflora Rose, the vegetation cover is dense (25-60% cover). Pennsylvania Sedge, Spotted Geranium, Bracken Fern, Royal Fern, American Hog-peanut, Virginia Creeper and Goldenrod species are common in the groundcover layer (≤1 m in height; >60% cover).



Photo 3-11: Dry – Fresh Black Oak Deciduous Forest (FOD1-3)

This forest community is estimated to be mid-aged to mature based on the size and composition of the tree species. The canopy trees are primarily large, mature Oaks. In the past ELC evaluation conducted by ERCA in 2008, much of the now Black Oak Deciduous Forest was characterized as Black Oak and Pin Oak Tallgrass Woodland. Since then, succession has resulted in a dense tree canopy (>60% cover) and changes to the underlying vegetation layers. Vernal pools, fallen logs and potential wildlife hibernacula are present throughout. The soil analysis characteristics indicate this community has a mineral soil substrate of fresh silty sand, fresh sandy loam or fresh loamy sand depending on location. The depth of the organic layer is 1 cm and there are no mottles or gleys. Depth to bedrock is >120 cm.

The Fresh – Moist Poplar Deciduous Forest is found surrounding Titcombe Drain and in other areas that appear to be more recently disturbed or early successional. Eastern Cottonwood is the dominant species in the canopy and subcanopy, with lesser amounts of Silver Maple, Manitoba Maple, Trembling Aspen, and Black Cherry. Canopy trees are >25 m tall and create >60% cover whereas subcanopy trees are 10-25 m tall and create 25-60% cover. The understory is abundant in Grey Dogwood and Black Cherry, but Red Ash and



Photo 3-12: Fresh – Moist Poplar Deciduous Forest (FOD8-1)

American Hazelnut are also present (2-10 m in height; >60% cover). Virginia Creeper, Spotted Geranium, Riverbank Grape, and Poison Ivy are common in the groundcover layer (0.2-0.5 m in height; >60% cover).

This forest community is estimated to be mid-aged based on the size and composition of the tree species. Wildlife habitat in the form of vernal pools, fallen logs and potential wildlife hibernacula are present throughout. The soil analysis characteristics indicate this community has a mineral soil substrate of moist sandy loam. The depth of the organic layer is 1 cm and the depth to mottles is 40 cm. Depth to bedrock is >120 cm.

The Tallgrass Prairie Heritage Park Area has both Oak-dominated and Poplar-dominated swamp communities. The Pin Oak Mineral Deciduous Swamp (SWD1-3) is comprised primarily of Swamp Pin Oak (dominant), Swamp White Oak, Silver Maple, and Eastern Cottonwood in the canopy (>25 m in height; >60% cover) with the same species, including Red Ash, comprising the sub-canopy (10-2 m in height; 25-60% or >60% cover depending on location). The Poplar Mineral Deciduous Swamp (SWD4-5) is almost entirely comprised of Eastern Cottonwood in the canopy (>25 m in height; >60% cover) with a mix of Oaks and Eastern Cottonwood in the subcanopy (10-25 m in height; 25-60% or >60% cover depending

on location). The understory shrub community is similar in these swamp communities and includes Grey Dogwood, Silky Dogwood, Red Ash, and American Hazelnut (2-10 m in height; 25-60% or >60% cover depending on location). However, the groundcover is quite different. Sedges, Bracken Fern, Royal Fern, Swamp Agrimony and Goldenrods comprise the groundcover layer in Oak swamp (≤ 1 m in height; >60% cover). In the Poplar swamp, the groundcover contains a mix of native and exotic shrubs and vines, such as Dogwoods, Virginia Creeper, Riverbank Grape, Autumn Olive, and Multiflora Rose (≤ 1 m in height; 25-60% or >60% cover depending on location).



Photo 3-13: Pin Oak Mineral Deciduous Swamp (SWD1-3)

The age of the swamp communities ranged from young (Poplar-dominated), mid-aged (Oak-dominated) to mature (Poplar-dominated) based on the size and composition of the tree species. Vernal pools, fallen logs and potential hibernacula provide wildlife habitat throughout these areas. The soil analysis characteristics indicate a variety of mineral soil substrates. In the Oak-dominated swamps, soil is wet to very wet sandy loam. The depth of the organic layer is 3-10 cm and the depth to mottles is 40 cm.

In the Poplar-dominated swamps, soil is moist sandy clay loam and moist clay loam. The depth of the organic layer is 1-4 cm and the depth to mottles is 20 cm or 55 cm depending on location. Depth to bedrock is >120 cm.

Cultural habitats in Tallgrass Prairie Heritage Park Area are found primarily in the utility corridor that runs southeast to northwest through the western portion of the site, and at the perimeter of the site. These communities have a history of disturbance over the past 40 yrs and may still be subject to ongoing or periodic disturbance to date (e.g., mowing, or other vegetation management activities). The largest area of cultural habitat is a mix of Dry – Fresh Old Field Meadow (CUM1-1) and Mineral Cultural Thicket (CUT1).

Native and exotic shrubs such as Multiflora Rose, American Hazelnut, Autumn Olive and Grey Dogwood dominate the understory layer. There are also significant portions of the utility right-of-way that are dominated by stands of invasive European Reed (2-10 m in height; 25-60% cover). Similarly, the groundcover layer is a mix native and exotic species. Reed Canarygrass is prevalent; however, Goldenrods, Sedges and Common Milkweed are also abundant (1-2 m in height; >60% cover).

The soil analysis characteristics indicate this successional community has a mineral soil substrate of fresh sandy loam. The depth of the organic layer is 1 cm and the depth to mottles is 50 cm (there are no gleys). Depth to bedrock is >120 cm.

All other cultural habitats were on private property and were not accessed for data collection. The Cultural Meadow, Thicket and Woodland Community Series on private property were determined based on a review of aerial images and general observations of vegetation structure from outside the property boundary where feasible.



Photo 3-14: Dry – Fresh Old Field Meadow (CUM1-1)/ Mineral Cultural Thicket (CUT1)

Tallgrass Prairie Heritage Park Area contains two rare provincially rare tallgrass ecosystems. Dry Black Oak – White Oak Tallgrass Woodland (TPW1-1) has Black Oak dominating the canopy with the occasional White Oak, Black Walnut, Pignut Hickory, and Eastern Cottonwood (>25 m in height; 25-60% cover or >60% cover depending on location). The subcanopy of the woodland contains abundant Black Oak, Black Cherry and occasional Pignut Hickory and Red Maple (2-10 m or 10-25 m in height; 10-25% cover depending on location).



Photo 3-15: Dry Black Oak – White Oak Tallgrass Woodland (TPW1-1)

Where the woodland community has been subject to prescribed burns, there is no understory present, and the groundcover layer has abundant Goldenrods, Many-flowered Woodrush, Pennsylvania Sedge and Royal Fern (0.2 – 0.5 m in height; >60% cover). This tallgrass woodland is estimated to be old growth based on the size and composition of the tree species. Notes taken during the field survey describe this community as a high-quality tallgrass woodland.

Where the woodland has not been subject to prescribed burns, the understory contains Black Cherry and Pignut Hickory (2-10 m in height; 10-25% cover) and the groundcover layer

contains Goldenrods, Pennsylvania Sedge, Spotted Geranium and Bracken Fern (0.2-0.5 m in height; >60% cover). This community is estimated to be mature with portions succeeding to deciduous forest.

Fallen logs and potential hibernacula provide wildlife habitat throughout the tallgrass woodland community. The soil analysis characteristics indicate this community has a mineral soil substrate of dry-fresh loamy sand to fresh/well-moderately-well sandy loam. The depth of the organic layer is 1 cm and the depth to mottles is 75 cm (in the interior woodland only). Depth to bedrock is >120 cm.

Tallgrass Prairie Heritage Park Area contains remnant Fresh – Moist Tallgrass Prairie (TPO2-1). These relatively open areas are dominated by a mix of grasses and forbs, including several prairie indicator species. There is also abundant Sedges and Rushes (*Juncus* sp.) in the groundcover layer (0.5-1 m; >60% cover).

Shrubs such as Grey Dogwood and Autumn Olive have begun encroachment into the understory (2-10 m in height; 0-10% cover) and the occasional Eastern Cottonwood and Swamp Pin Oak have reached the subcanopy (10-25 m in height; 0-10% cover) and canopy layers (>25 m in the height; 0-10% cover).



Photo 3-16: Fresh – Moist Tallgrass Prairie (TPO2-1)



Photo 3-17: Duckweed Floating – leaved Shallow Aquatic (SAF1-3)

The soil analysis characteristics indicate this community has a mineral soil substrate of moist clay loam. The depth of the organic layer is 1 cm and the depth to mottles is 40 cm (no gleys observed). Depth to bedrock is >120 cm.

Lastly, the one shall water feature found in the center of the natural area is designated a Duckweed Floating – leaved Shallow Aquatic (SAF1-3) community. The pond is dominated by Small Duckweed with lesser amounts of emergent European Reed at the edges.

The upland areas around the pond contain an understory of Silky Dogwood (2-10 m in height; 0-10% cover); a subcanopy containing Silver Maple, Eastern Cottonwood, and Willows (*Salix* sp.) (10-25 m in height; 0-10% cover); and a higher canopy of Eastern Cottonwood (>25 m in height; 0-10% cover).

This community contains amphibian and reptile hibernacula.

3.2.5.2 Rare Vegetation Communities

The following rare communities were identified and mapped in the Tallgrass Prairie Heritage Park Area. The rarity ranks for the vegetation community are in accordance with those identified by the NHIC. Tallgrass Prairie Heritage Park Area contains four vegetation communities that are ranked provincially significant, including two community that is also ranked globally significant:

- Fresh – Moist Tallgrass Prairie Type (TPO2-1; G2/S1)
- Dry Black Oak – White Oak Tallgrass Woodland Type (TPW1-1; G2/S1)
- Dry – Fresh Black Oak Deciduous Forest Type (FOD1-3; G4/S3)
- Pin Oak Mineral Deciduous Swamp Type (SWD1-3; G2/S2S3)

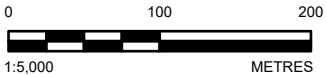
Together, these vegetation communities comprise 17.77 ha or 30.94% of the natural area (Table 3-15).

Further to the communities listed above, it is important to note that with management to remove woody invasive and exotic species and prescribed burning, the disturbed Mineral Dry – Moist Old Field Meadow Type / Fresh – Moist Tallgrass Prairie Type and successional Fresh – Moist Tallgrass Prairie Type / Oak Mineral Deciduous Swamp could be restored to rare tallgrass community types. If this were to occur, an additional 2.32 ha (4.04%) of rare vegetation communities could be re-established in Tallgrass Prairie Heritage Park Area (Table 3-20).

In addition to the rare plant communities above, the Tallgrass Prairie Heritage Park Area also contains land with other environmentally significant designations, including a portion of the provincial Ojibway Prairie Wetland Complex (PSW), Prairie Remnants (North of Titcombe Rd.) Life ANSI, and an Environmentally Significant Area regulated by ERCA (Figure 3-12).



- LEGEND**
- NATURAL HERITAGE REVIEW BOUNDARY
 - REGULATION AREA (ESSEX REGION CONSERVATION AUTHORITY)
 - ENVIRONMENTALLY SIGNIFICANT AREA
 - EVALUATED PROVINCIAL WETLAND (LAND INFORMATION ONTARIO, 2021)
 - LIFE ANSI (LAND INFORMATION ONTARIO, 2021)
 - MUNICIPAL DRAIN
 - OVERHEAD UTILITY LINE/UTILITY CORRIDOR



REFERENCE(S)
COUNTY OF ESSEX, IMAGERY SERVICE: COUNTY 2022 AIRPHOTO, COUNTY 2021 AIRPHOTOMAP DATA © OPENSTREETMAP CONTRIBUTORS, MICROSOFT, FACEBOOK, INC. AND ITS AFFILIATES, ESRI COMMUNITY MAPS CONTRIBUTORS, MAP LAYER BY ESRI. LAND INFORMATION ONTARIO. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE – ONTARIO, CANADA. PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N.



PROJECT
PROPOSED NATIONAL URBAN PARK IN WINDSOR
OJIBWAY PRAIRIE COMPLEX
NATURAL HERITAGE REVIEW REPORT

TITLE
DESKTOP NATURAL HERITAGE REVIEW
TALLGRASS PRAIRIE HERITAGE PARK AREA

CONSULTANT	YYYY-MM-DD	2024-02-22
	DESIGNED	SS
	PREPARED	HB
	REVIEWED	
	APPROVED	



3.2.5.3 Significant Trees

The composition of large, old trees (>50 cm DBH) in the Tallgrass Prairie Heritage Park Area is presented in Table 3-17 and Figure 3-13. There are 10 species with individuals measuring >50 cm DBH. The most frequently sampled species was Black Oak (52%), followed by Eastern Cottonwood (27%) and Swamp Pin Oak (8%). Large White Oak, Bur Oak and Swamp White Oak were also present, comprising an additional 9% of the trees sampled. In total, Oak species comprised the greatest proportion (69%) of large-diameter trees, followed by Eastern Cottonwood (27%) and other species present in smaller numbers (Table 3-17, Figure 3-13).

Large Oaks ranged in age from approximately 59 (Swamp Pin Oak) to >200 yrs old (Black Oak). The average age of large-diameter tree species is presented in Table 3-17 and Figure 3-14. The oldest tree species on average was White Oak (averaging 136 yrs old), followed by Bur Oak (110 yrs old) and Black Oak (104 yrs old). A single Swamp White Oak and Pignut Hickory were also recorded and determined to be approximately 130 and 182 yrs old, respectively. The youngest, large tree species sampled was Eastern Cottonwood, averaging 54 yrs old. Like Eastern Cottonwood recorded in other natural areas, the large individuals in Tallgrass Prairie Heritage Park Area would also be considered “old” given the species typical mortality of 60 yrs.

The large trees sampled are present within the Black Oak Deciduous Forest and Black Oak – White Oak Tallgrass Woodland.

Table 3-17: Composition of Large Tree Species (>50 cm DBH) Present in the Tallgrass Prairie Heritage Park Area

Common Name	Scientific Name	S-Rank	No. Recorded	Tree Size (cm DBH)			Estimate of Tree Age (yr)		
				Min.	Max.	Average DBH (±SE)	Min.	Max.	Average Age (±SE)
Silver Maple	<i>Acer saccharinum</i>	S5	1		60.0			71	
Pignut Hickory	<i>Carya glabra</i>	S3	1		61.5			182	
Black Walnut	<i>Juglans nigra</i>	S4?	1		58.5			104	
Eastern Cottonwood	<i>Populus deltoides</i>	S5	28	50.0	100.0	68.3 (±2.8)	39	79	54 (±2)
White Oak	<i>Quercus alba</i>	S5	5	50.0	96.3	69.2 (±8.8)	98	190	136 (±17)
Swamp White Oak	<i>Quercus bicolor</i>	S4	1		66.0			130	
Bur Oak	<i>Quercus macrocarpa</i>	S5	3	52.2	57.8	55.9 (±1.8)	103	114	110 (±4)
Swamp Pin Oak	<i>Quercus palustris</i>	S4	9	50.0	95.7	63.2 (±4.5)	59	113	75 (±5)
Black Oak	<i>Quercus velutina</i>	S4	55	50.0	133.0	65.9 (±2.0)	79	209	104 (±3)
American Elm	<i>Ulmus americana</i>	S5	1		52.0			82	
Total Number of Large Trees Sampled			105						

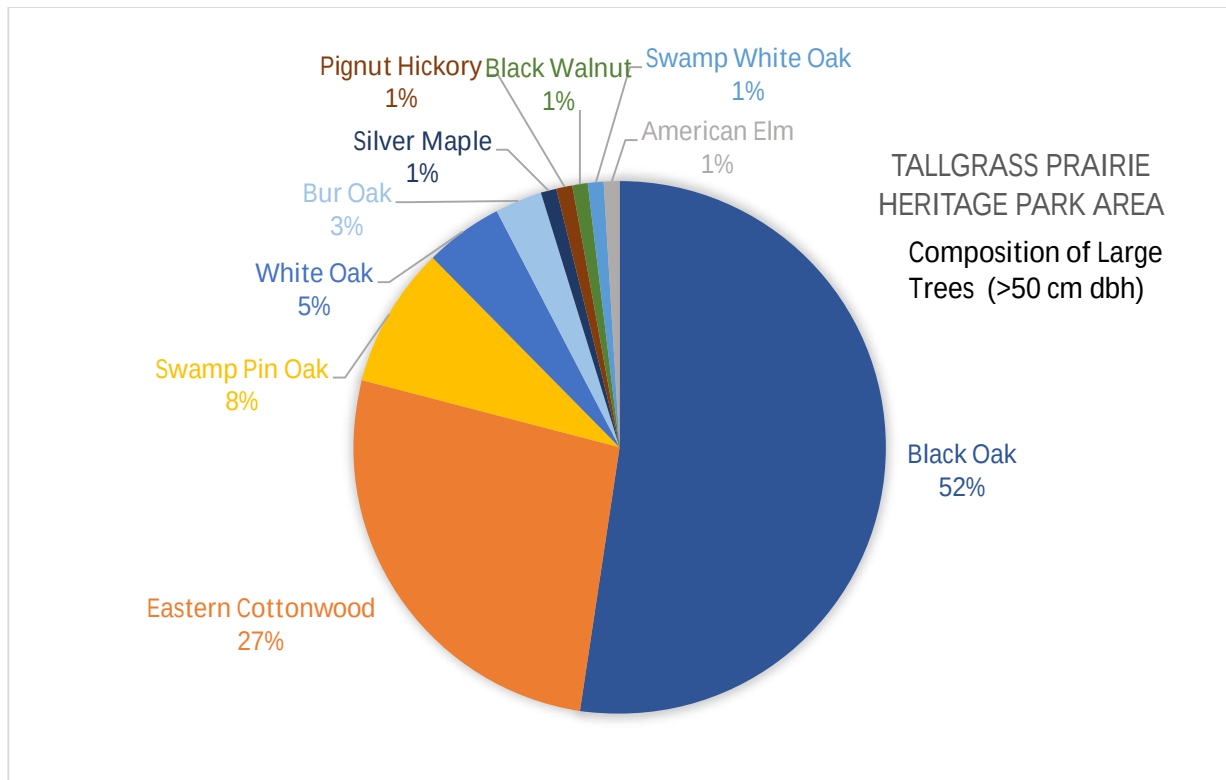


Figure 3-13: Composition of Large Tree Species (>50 cm DBH) in Tallgrass Prairie Heritage Park Area

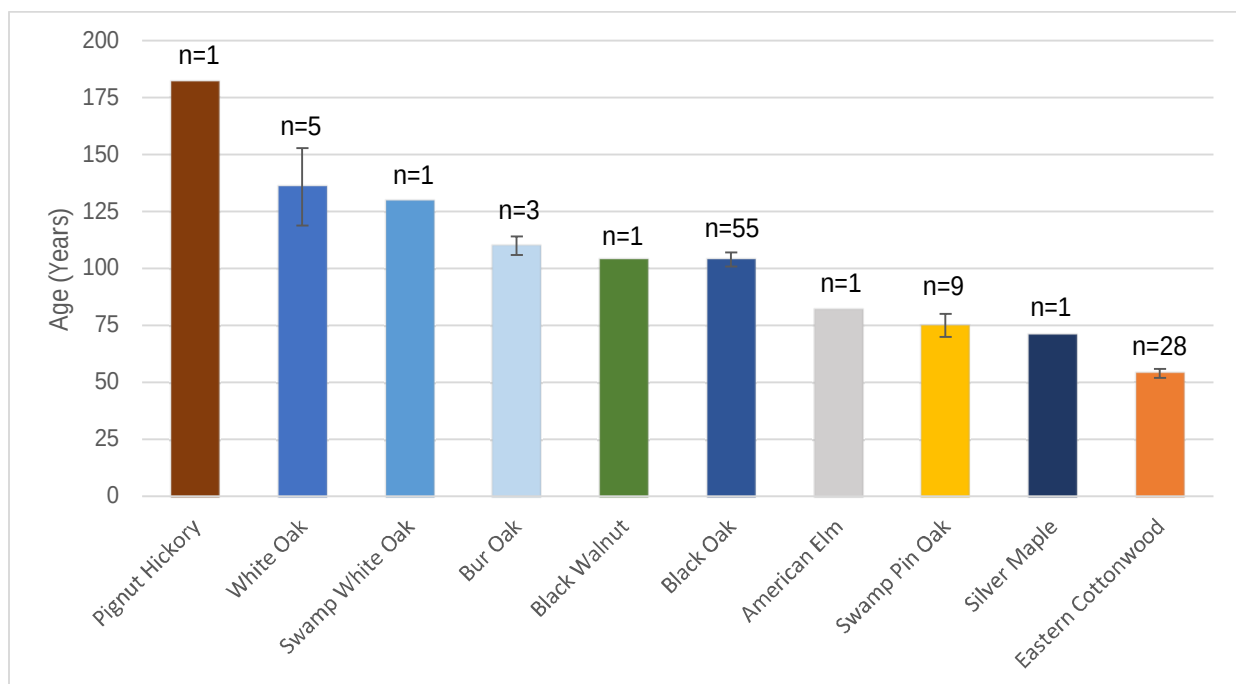


Figure 3-14: Average Age of Large Trees in Tallgrass Prairie Heritage Park Area

3.2.5.4 Plant SAR and Provincially Rare Species

Natural heritage assessments were conducted in the Tallgrass Prairie Heritage Park Area by Pratt (1979), ERCA (1992 and 2008) and the City (2001). Together these assessments identified a total of 71 provincially rare plant species including 12 listed as SAR.

In surveys conducted by WSP in 2022, an additional rare species was recorded (for a total of 72 provincially rare plant species).

Lastly, in addition to the species known to occur in the Tallgrass Prairie Heritage Park Area, a review of secondary source information from the NHIC and rare species lists compiled for the entire Ojibway Prairie Complex indicate that many additional provincially rare species (including SAR) may occur within and/or around the natural area where suitable habitat exists (Appendix B).

Table 3-18: Plant SAR and Provincially Rare Species Observed in Tallgrass Prairie Heritage Park Area

(Removed to protect sensitive information)

3.2.5.5 Invasive Exotic Species

Many of the non-native species found in Tallgrass Prairie Heritage Park Area during the natural heritage assessments can be further characterized as invasive or aggressive species (Table 3-19; Urban Forest Associates Inc., 2002). These species, if left unchecked, have the potential to become dominant in the landscape and threaten native biodiversity. Below is a list of Category 1 to 3 invasive exotic species that are recommended for population monitoring in the site. These species are most likely to require targeted management to keep populations under control or to eradicate them entirely.

Table 3-19: Select Invasive Exotic Species in Tallgrass Prairie Heritage Park Area

Common Name	Scientific Name	Category No. ¹
Manitoba Maple	<i>Acer negundo</i>	1
Garlic Mustard	<i>Alliaria petiolate</i>	1
Orchard Grass	<i>Dactylis glomerata</i>	3
Autumn Olive	<i>Elaeagnus umbellata</i>	1
Purple Loosestrife	<i>Lythrum salicaria</i>	1
White Mulberry	<i>Morus alba</i>	1
European Reed	<i>Phragmites australis ssp. australis</i>	1
Black Locust	<i>Robinia pseudo-acacia</i>	2
Multiflora Rose	<i>Rosa multiflora</i>	1

Notes: ¹ Category 1 (aggressive invasive); Category 2 (highly invasive but niche-specific); and Category 3 (moderately invasive but can become locally dominant when the proper conditions exist).

3.2.6 OJIBWAY PRAIRIE PROVINCIAL NATURE RESERVE AREA

The Ojibway Prairie Provincial Nature Reserve and adjacent natural area is approximately 140 ha and is bound by Matchett Road to the west, Malden Road to the east, Sprucewood Avenue to the south, and Tallgrass Prairie Heritage Park Area to the north (Figure 1-1). Recognized as an important natural area by botanists in the late 1960s, the initial phase of land acquisition for the nature reserve began in 1971 with the purchase of 70 ha in co-operation with the Nature Conservancy of Canada, the Province of Ontario and the City of Windsor (Pratt, 1979). The land was formally established as a nature reserve in 1977. Subsequent land acquisitions were added over the following decades. Today, the property includes maintained trails for pedestrian access and passive recreational use.

In 1979, the City of Windsor and Ontario Ministry of Natural Resources conducted the first preliminary life science inventory of the nature reserve (Pratt, 1979) with follow-up botanical surveys conducted by Pratt in 1984-1985, 1990-1992 and 2008. Since then, the MNRF has compiled two General Natural Areas Reports from studies completed by Pratt, with several updates from Ministry staff (MNRF, 2021a and 2021b). Ontario Parks also prepared the Ojibway Prairie Park Management Plan (2001) which outlines the objectives for protection, natural heritage appreciation, land stewardship, and day-to-day operations of the nature reserve.

The Ojibway Prairie Provincial Nature Reserve Area has been described as containing extensive areas of tallgrass prairie, oak savannah and woodland, successional forb prairies and other community types. Prairie associations occur in both wet-mesic to dry-mesic areas. Where savannahs and woodlands occur, Pin Oak is the dominant tree species in wet-mesic areas, with Black Oak and White Oak present on dry ridges. Altogether over 500 flowering plants species have been documented in and around the area, of which more than 100 are rare in Ontario and over 60 share an affinity to prairie ecosystems (MNRF, 2021a and 2021b).

WSP completed updated ELC vegetation community mapping of the Ojibway Prairie Provincial Nature Reserve Area on June 20-21, 24 and 27-28, 2022. Results indicate the presence of 23 natural ELC Vegetation Types in 14 Community Series (Table 3-20, Figure 3-15). These vegetation types represent those described in Lee et al., 1998. In addition, there is one anthropogenic Community Series present, Greenlands, that better represents those described in Lee, 2008. Based on these results, the Ojibway Prairie Provincial Nature Reserve Area can be described as having very high vegetation community diversity.

The ELC vegetation communities are comprised of 90.64% (126.21 ha) terrestrial habitat, 5.46% (7.60 ha) wetland habitat and 2.33% (3.24 ha) aquatic habitat (Table 3-21). In addition, there is one transitional habitat comprising both terrestrial (i.e., forest) and wetland (i.e., swamp) community characteristics (1.11% or 1.55 ha).

Terrestrial habitat includes two herbaceous plant community series (Open Tallgrass Prairie and Cultural Meadow) and numerous woody plant community series including Tallgrass Savannah and Woodland, Deciduous Forest and Cultural Thicket and Woodland. Wetlands include Deciduous Swamp and Thicket Swamp communities. There is also one Open Aquatic and one Shallow Aquatic community. Based on the area associated with these communities,

the Ojibway Prairie Provincial Nature Reserve Area can be characterized as tallgrass ecosystems (34.31% or 47.77 ha), followed by forest (30.59% or 42.59 ha), cultural habitats (25.75% or 35.85 ha) and swamp (5.46% or 7.60 ha).

A description of the dominant ELC vegetation communities in the Ojibway Prairie Provincial Nature Reserve Area is provided below. The ELC vegetation community mapping results are shown in Figure 3-15.

Table 3-20: Ojibway Prairie Provincial Nature Reserve Area ELC Vegetation Community Diversity

Community Class	Community Series	ELC Code	Ecosite / Vegetation Type	G-rank	S-rank	Area (ha)	%
Tallgrass Prairie, Savannah and Woodland	Open Tallgrass Prairie	TPO2-1	Fresh – Moist Tallgrass Prairie Type	G2	S1	24.21	17.38
	Tallgrass Savannah	TPS1-1	Dry Black Oak Tallgrass Savannah Type	G3	S1	3.42	2.46
		TPS2	Fresh – Moist Tallgrass Savannah Type			3.90	2.80
	Tallgrass Woodland	TPW2-1	Fresh – Moist Black Oak – White Oak Tallgrass Woodland Type	G2	S1	16.24	11.66
Forest	Deciduous Forest	FOD1-3	Dry – Fresh Black Oak Deciduous Forest Type	G4?	S3	2.49	1.79
		FOD2-2	Dry – Fresh Oak – Hickory Deciduous Forest Type	G4?	S3S4	8.11	5.83
		FOD7-4	Fresh – Moist Black Walnut Lowland Deciduous Forest Type	G4?	S2S3	1.44	1.03
		FOD8-1	Fresh – Moist Poplar Deciduous Forest Type			27.72	19.90

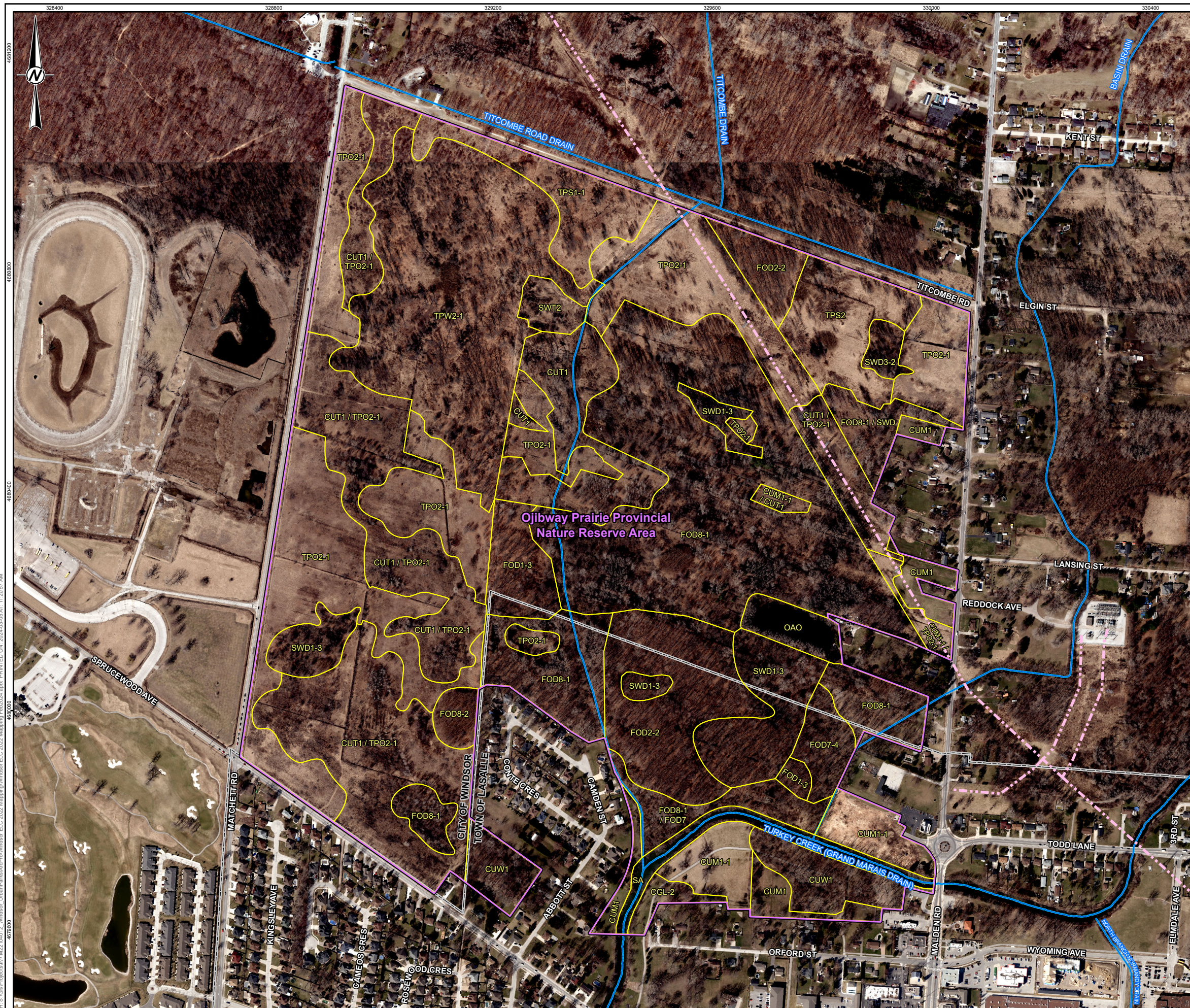
Community Class	Community Series	ELC Code	Ecosite / Vegetation Type	G-rank	S-rank	Area (ha)	%
Forest	Deciduous Forest	FOD8-1 /FOD7	Fresh – Moist Poplar Deciduous Forest Type/ Fresh – Moist Lowland Deciduous Forest Ecosite			2.07	1.48
		FOD8-2	Fresh – Moist Sassafras Deciduous Forest Type			0.76	0.55
Cultural	Cultural Meadow	CUM1	Mineral Cultural Meadow Ecosite			2.63	1.89
		CUM1-1	Dry – Moist Old Field Meadow Type			3.42	2.46
		CUM1-1 /TPO2-1	Dry – Moist Old Field Meadow Type/ Fresh – Moist Tallgrass Prairie Type			0.65	0.47
	Cultural Meadow/ Cultural Thicket	CUM1-1 /CUT1	Dry – Moist Old Field Meadow Type/ Mineral Cultural Thicket Ecosite			0.32	0.23
	Cultural Thicket	CUT1	Mineral Cultural Thicket Ecosite			5.05	3.63
	Cultural Thicket/ Open Tallgrass Prairie	CUT1/ TPO2-1	Mineral Cultural Thicket/ Fresh – Moist Tallgrass Prairie Type			20.25	14.54
	Cultural Woodland	CUW1	Mineral Cultural Woodland Ecosite			3.54	2.54
Swamp	Deciduous Swamp	SWD1-3	Pin Oak Mineral Deciduous Swamp Type	G2	S2S3	6.07	4.36
		SWD3-2	Silver Maple Mineral Deciduous Swamp Type			0.63	0.45

Community Class	Community Series	ELC Code	Ecosite / Vegetation Type	G-rank	S-rank	Area (ha)	%
	Thicket Swamp	SWT2	Mineral Thicket Swamp Ecosite			0.90	0.65
Open Water	Open Aquatic	OA0				1.33	0.95
Shallow Water		SA				1.91	1.37
Transitional (Terrestrial/Wetland)	Deciduous Forest /Deciduous Swamp	FOD8-1 /SWD	Fresh – Moist Poplar Deciduous Forest Type/ Deciduous Swamp			1.55	1.11
Constructed*	Greenlands	CGL_2	Parkland			0.65	0.47
Total						139.25	100

Notes: * Indicates an anthropogenic community series as described in Lee, 2008.

Table 3-21: Ojibway Prairie Provincial Nature Reserve Area ELC Community Class Statistics

ELC Community Class	Area (ha)	Proportion (%)
Terrestrial	126.21	90.64
Tallgrass Prairie, Savannah and Woodland	47.77	34.31
Forest	42.59	30.59
Cultural	35.85	25.75
Wetland	7.60	5.46
Swamp	7.60	5.46
Aquatic	3.24	2.33
Open Water	1.33	0.96
Shallow Water	1.91	1.37
Transitional (Terrestrial/Wetland)	1.55	1.11
Swamp/Forest	1.55	1.11
Anthropogenic	0.65	0.47
Constructed	0.65	0.47
Total	139.25	100



LEGEND

-  NATURAL HERITAGE REVIEW BOUNDARY
 ELC VEGETATION COMMUNITY BOUNDARY
 MUNICIPAL DRAIN
 OVERHEAD UTILITY LINE/UTILITY CORRIDOR

ELC CODE	ELC DESCRIPTION
CGL-2	PARKLAND
CUM1	MINERAL CULTURAL MEADOW ECOSITE
CUM1-1	DRY - MOIST OLD FIELD MEADOW TYPE
CUT1	MINERAL CULTURAL THICKET ECOSITE
CUW1	MINERAL CULTURAL WOODLAND ECOSITE
FOD1-3	DRY - FRESH BLACK OAK DECIDUOUS FOREST TYPE
FOD2-2	DRY - FRESH OAK - HICKORY DECIDUOUS FOREST TYPE
FOD7	FRESH - MOIST LOWLAND DECIDUOUS FOREST ECOSITE
FOD7-4	FRESH - MOIST BLACK WALNUT LOWLAND DECIDUOUS FOREST TYPE
FOD8-1	FRESH - MOIST POPLAR DECIDUOUS FOREST TYPE
FOD8-2	FRESH - MOIST SASSAFRAS DECIDUOUS FOREST TYPE
OA0	OPEN AQUATIC POND
SA	SHALLOW WATER
SWD	DECIDUOUS SWAMP
SWD1-3	PIN OAK MINERAL DECIDUOUS SWAMP TYPE
SWD3-2	SILVER MAPLE MINERAL DECIDUOUS SWAMP TYPE
SWT2	MINERAL THICKET SWAMP ECOSITE
TP02-1	FRESH - MOIST TALLGRASS PRAIRIE TYPE
TPS1-1	DRY BLACK OAK TALLGRASS SAVANNA TYPE
TPS2	FRESH - MOIST TALLGRASS DECIDUOUS SAVANNA ECOSITE
TPW2-1	FRESH - MOIST OAK TALLGRASS WOODLAND TYPE



REFERENCE(S)

COUNTY OF ESSEX, IMAGERY SERVICE: COUNTY 2022 AIRPHOTO, COUNTY 2021 AIRPHOTOMAP DATA © OPENSTREETMAP CONTRIBUTORS, MICROSOFT, FACEBOOK, INC. AND ITS AFFILIATES, ESRI COMMUNITY MAPS CONTRIBUTORS, MAP LAYER BY ESRI. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE – ONTARIO, CANADA.
PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N.

CLIENT



PROJECT
PROPOSED NATIONAL URBAN PARK IN WINDSOR
OJIBWAY PRAIRIE COMPLEX
NATURAL HERITAGE REVIEW REPORT

TITLE

**2022 ELC VEGETATION COMMUNITY MAPPING
OJIBWAY PRAIRIE PROVINCIAL NATURE RESERVE AREA**

CONSULTANT

YYYY-MM-DD 2024-03-05

DESIGNED

PREPARED

REVIEWED

REVIEWED



PROJECT NO.
IM22104012

CONTROL

REV.
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FIGURE 3-15

3.2.6.1 ELC Community Descriptions

Tallgrass prairie, savannah and woodland ecosystems comprise over one-third of the Ojibway Prairie Provincial Nature Reserve Area. Fresh – Moist Tallgrass Prairie (TPO2-1) is found across the site, but most notably in areas along Matchett Road, Titcombe Trail and in the utility right-of-way.

The prairies are comprised of a diverse mix of native grasses and forbs in the groundcover layer (0.5-1 m in height; >60% cover). Grasses include Big Bluestem, Yellow Indiangrass, Old Switch Panicgrass and Bluejoint Reedgrass. Forbs include a variety of Milkweeds, Wild Bergamot, Virginia Mountain-mint, Round-headed Bush-clover and Goldenrod species. A majority of the tallgrass prairie habitat has an open canopy and subcanopy layer, with exception of an occasional Silver Maple, Swamp Pin Oak, Black Oak, Black Cherry or Eastern Cottonwood



Photo 3-18: Fresh – Moist Tallgrass Prairie (TPO2-1)

(>25 m or 10-25 m in height depending on location; 0-10% cover). The understory is a mix of woody native and exotic species including Grey Dogwood, Rough-leaved Dogwood, American Hazelnut, Autumn Olive, White Mulberry and Multiflora Rose (1-2 m or 2-10 m depending on location; 0-10% or 10-25% depending on location).

The soil analysis characteristics of this community indicate a few different moisture levels, ranging from moderately fresh to fresh and very moist, depending on location. Soil texture is also variable and includes clay, silt and sandy loams, as well as silty sand and loamy sand. The depth of the organic layer is 1 cm throughout. The depth to mottles ranged from 20-70 cm where present, and gleys were found in two locations at 30 cm and 50 cm deep. Depth to bedrock is >120 cm.

Notes taken during the ELC field survey describe the tallgrass prairies as high-quality and high-diversity habitat.

Fresh – Moist Black Oak – White Oak Tallgrass Woodland (TPW2-1) is found in the northwest portion of the Nature Reserve Area. The canopy is mostly Black Oak followed by Swamp Pin Oak, White Oak, and Pignut Hickory (>25 m in height; >60% cover depending on location). These same species are present in the subcanopy, with the addition of Black Cherry (10-25 m in height; 25-60% cover). American Hazelnut is dominant in the understory with occasional Grey Dogwood and Blackberry species (2-10 m in height; 25-60% cover).

The understory is very diverse, with many Sedges, Ferns, Bulrushes (*Scirpus* sp.) and Goldenrods present, as well as Canada Anemone, Swamp Agrimony, Virginia Mountain-mint,

American Hog-peanut, and Wild Bergamot. At the time of field surveys, the understory was 0.5-1.0 m in height and >60% cover.

The age of the woodland is described as old growth based on the size and composition of the tree species. The largest and oldest Black Oaks, White Oaks and Pignut Hickories in the Nature Reserve Area are found in this location.

Historically, the area was described as having topography consisting of low, sandy ridges separated by broad, moist depressions (Pratt, 1979). Oak savannah dominated the drier ridges and blended into tallgrass prairie in the moist depressions (Pratt, 1979). At the time, the Oaks were described as mature

and even-aged, with open growth (approximately 50% cover). Many of the forbs found in the groundcover layer were also present in the adjacent prairie, in addition to those typically found in savannah and woodlands. Today, this general description of the plant community is still appropriate as many of the groundcover species are considered tallgrass prairie indicators.



Photo 3-19: Fresh – Moist Black Oak – White Oak Tallgrass Woodland (TPW2-1)

The soil analysis characteristics indicate this community has a mineral soil substrate of moderately fresh loamy sand. The depth of the organic layer is 1 cm and the depth to mottles is 50 cm (no gleys observed). Depth to bedrock is >120 cm.

The remaining portion of tallgrass habitat is Tallgrass Savannah, which ranges from Dry Black Oak Tallgrass Savannah (TPS1-1) to Fresh – Moist Tallgrass Savannah (TPS2). These communities are found in the northern portion of the Nature Reserve Area. Historically these areas were mapped primarily as tallgrass and forb-dominated prairies (Pratt, 1979), but now have tree cover comprised of Oaks, Pignut Hickory, Black Walnut and Black Cherry.

The Dry Black Oak Tallgrass Savannah has a canopy dominated entirely by Black Oak (>25 m in height; 25-60% cover). The subcanopy contains both Black Oak and Pignut Hickory (10-25 m in height; 10-25% cover). The understory is regenerating Black Oak and Pignut Hickory, as well as American Hazelnut (1-2 m in height; 25-60% cover). The groundcover layer contains abundant Bluejoint Reed Grass, Goldenrods and Sedges. Other tallgrass indicator species include Big Bluestem, Wild Bergamot, Virginia Mountain-mint, and Butterfly Milkweed (0.5-1 m in height; >60% cover). Marsh Fern, Sensitive Fern, and Royal Fern are also common.

Notes taken during the field survey describe this community as a high-quality savannah with low pockets supporting wet-mesic species and elevated areas supporting drier, upland species.

The age of the Black Oak Tallgrass Savannah is described as mature to old growth based on the size and composition of the tree species. Several very large Black Oaks are found in this location. Fallen logs and potential wildlife hibernacula are present throughout. The soil analysis characteristics indicate this community has a mineral soil substrate of moderately fresh silty sand. The depth of the organic layer is 1 cm and the depth to mottles is 40 cm (no gleys observed). Depth to bedrock is >120 cm.



Photo 3-20: Dry Black Oak Tallgrass Savannah (TPS1-1)

The Fresh – Moist Tallgrass

Savannah (TPS2) is described as a mosaic of open areas interspersed with some smaller, more densely treed pockets. The canopy contains Silver Maple, Swamp Pin Oak, Black Oak, and Black Walnut (>25 m in height; 10-25% cover). The subcanopy contains equal amounts of Swamp Pin Oak, Black Cherry, Black Oak and Black Walnut (10-25 m in height; 10-25% cover). The understory contains occasional American Hazelnut, Eastern Buttonbush and invasive Black Locust (2-10 m in height; 10-25% cover). In the open groundcover layer, Big Bluestem is dominant and Yellow Indiangrass, Bluejoint Reedgrass and Goldenrods are abundant. Other forbs include Spotted Joe Pye Weed, Common Milkweed and Virginia Mountain-mint (0.5-1 m in height; >60% cover). Ferns and Sedges are also common.

The age of this savannah is described as mature based on the size and composition of the tree species; however, woody plant succession is occurring in several areas. Vernal pools provide wildlife habitat. The soil analysis characteristics indicate this community has a mineral soil substrate of moderately fresh loamy sand. The depth of the organic layer is 1 cm and no mottles or gleys were observed. The depth to bedrock is >120 cm.

Deciduous forest communities also comprise a large portion of the Ojibway Prairie Provincial Nature Reserve Area, especially in the center and southeast areas. There are six different deciduous forest types, three of which are recognized as provincially rare. These communities, as well as the largest community by area, Fresh – Moist Poplar Deciduous Forest, are described in detail below.

The largest deciduous forest community in the Nature Reserve Area is a Fresh – Moist Poplar Deciduous Forest (FOD8-1). Eastern Cottonwood is dominant in the canopy, followed by abundant Trembling Aspen and occasional Red Maple (>25 m in height; >60% cover). Swamp Pin Oak is also present but uncommon. The subcanopy contains the same species present in the canopy, with the addition of Black Cherry (10-25 m in height; 25-60% cover). The understory is a dense mix of shrubs and small trees, including abundant Grey Dogwood, Red Ash, Hawthorn, and Multiflora Rose (2-10 m in height; >60% cover). The groundcover layer

contains Sedges, Swamp Agrimony, Royal Fern, and Bracken Fern (0.2-0.5 m in height; >60% cover). Tallgrass prairie species are also present but uncommon.



Photo 3-21: Fresh – Moist Poplar Deciduous Forest (FOD8-1)

This Poplar Deciduous Forest is estimated to be mid-aged based on the vegetation structure and composition of the tree species. Historically, much of the area was subject to agricultural disturbance (Pratt, 1979). Succession is still ongoing as the area appears to be a mix of forest, thicket, and very small pockets of moist tallgrass prairie. Wildlife habitat is present in the form of vernal pools, fallen logs and potential hibernacula.

Soil analysis indicates this community has a mineral soil substrate of moist silty sand. The depth of the organic layer is 1 cm and the depth to mottles is 70 cm (no gleys observed). Depth to bedrock is >120 cm.

The Dry – Fresh Black Oak Deciduous Forest (FOD1-3) has a canopy dominated by Black Oak with occasional Pignut Hickory and Swamp Pin Oak (>25 m in height; >60% cover). Black Cherry is abundant in the subcanopy with occasional Pignut Hickory (10-25 cm in height; 25-60% cover). The understory contains sparse shrubs and small trees including American Hazelnut, Grey Dogwood, Multiflora Rose and Pignut Hickory (2-10 m in height; 0-10% cover). In the understory, Sedges, May-apple, Spotted Geranium and Royal Fern are abundant (0.2 – 0.5 m in height; >60% cover).



Photo 3-22: Dry – Fresh Black Oak Deciduous Forest (FOD1-3)

This Black Oak deciduous forest community is estimated to be mature based on the size and composition of the tree species. Wildlife features in the form of fallen logs and potential hibernacula are common throughout. Soil analysis characteristics indicate this community has a mineral soil substrate of dry-fresh sandy loam. No organic layer is present. The depth to mottles is 55 cm (no gleys observed). The depth to bedrock is >120 cm.

The Dry – Fresh Oak – Hickory Deciduous Forest (FOD2-2) is characterized by a canopy dominated by Black Oak and abundant Pignut Hickory (>25 m in height; >60% cover). There is no subcanopy layer, but Pignut Hickory dominates the understory (2-10 m in height; >60% cover). Groundcover is dominated by Sedges and occasional Bracken Fern, White Snakeroot and Spotted Geranium (0.2-0.5 m in height; 25-60% cover). The groundcover is sparse in some locations due to the dense canopy cover.



Photo 3-23: Dry – Fresh Oak – Hickory Deciduous Forest (FOD2-2)

This Oak – Hickory deciduous forest community is estimated to be mature based on the size and composition of the tree species. A majority of the large, very old Pignut Hickories are found in this community. Wildlife features in the form of fallen logs and potential wildlife hibernacula are common throughout. The soil analysis characteristics indicate this community has a mineral soil substrate of dry loamy sand. The depth of the organic layer is 1 cm and there are no mottles or gleys. Depth to bedrock is >120 cm.

The last of the rare forest communities is a Fresh – Moist Black Walnut Lowland Deciduous Forest (FOD7-4). This community is located on private property adjacent to the southeast corner of the Nature Reserve Area, near Malden Road and Todd Lane. WSP did not access this location but made a general observation of the vegetation structure and dominant species from outside the private property boundary. The canopy is dominated almost completely by Black Walnut (>60% cover). The trees also appear to be very similar in size (10-25 m in height) and age.

Mineral Cultural Thicket (CUT1) in combination with Fresh – Moist Tallgrass Prairie (TPO2-1) is particularly common in the west and southwestern portions of the Nature Reserve Area. Historical aerial photographs (circa 1948 and 1978) show the area was most open tallgrass prairie with some portions under agriculture until about 1974 (Pratt, 1976). There are still many tallgrass prairie species present throughout the area, but woody plant succession has resulted in a mosaic of thicket and prairie habitats. Trees are present in the canopy and subcanopy layers in some areas, whereas other areas are open.

Where trees reach the canopy layer, Eastern Cottonwood, Silver Maple and Swamp Pin Oak are common species (>25 m in height; 0-10% or 10-25% depending on location). The subcanopy is more diverse, with Red Ash, Black Oak, and Trembling Aspen also present (2-10 m or 10-25 m in height depending on location; 10-25% cover). The understory is typically dense with Autumn Olive, American Hazelnut, Grey Dogwood and Silky Dogwood (2-10 m in height; 25-60% or >60% cover depending on location).



Photo 3-24: Mineral Cultural Thicket (CUT1)/Fresh – Moist Tallgrass Prairie (TPO2-1)

The groundcover layer is mostly Goldenrods, but Big Bluestem, Wild Bergamot, Virginia Mountain-mint, Black-eyed Susan, and Common Milkweed are also present throughout. Less common species include Milkweeds, Foxglove Beardtongue, Yellow Indiangrass and Old Switch Panicgrass. Swamp Agrimony, Canada Anemone, Marsh Fern, and Royal Fern are noted in moist areas (0.5-1 m in height; >60% cover).

The thicket community is described as young and undergoing succession, with an abundance of tallgrass prairie species still present in remaining open areas. Vernal pools, fallen logs and potential hibernacula offer wildlife habitat throughout the area.



Photo 3-25: Mineral Cultural Thicket (CUT1) in the southern portion of Ojibway Prairie Provincial Nature Reserve Area

Soil analysis characteristics indicate a few different moisture levels, ranging from moderately fresh, moist to very moist, depending on location. Soil texture is also variable and includes silty clay, clay loam and loamy sand. Depth of the organic layer is 1 cm throughout. The depth to mottles ranged from 25-45 cm and gleys were found in one location at 65 cm deep. Depth to bedrock is >120 cm.

3.2.6.2 Rare Vegetation Communities

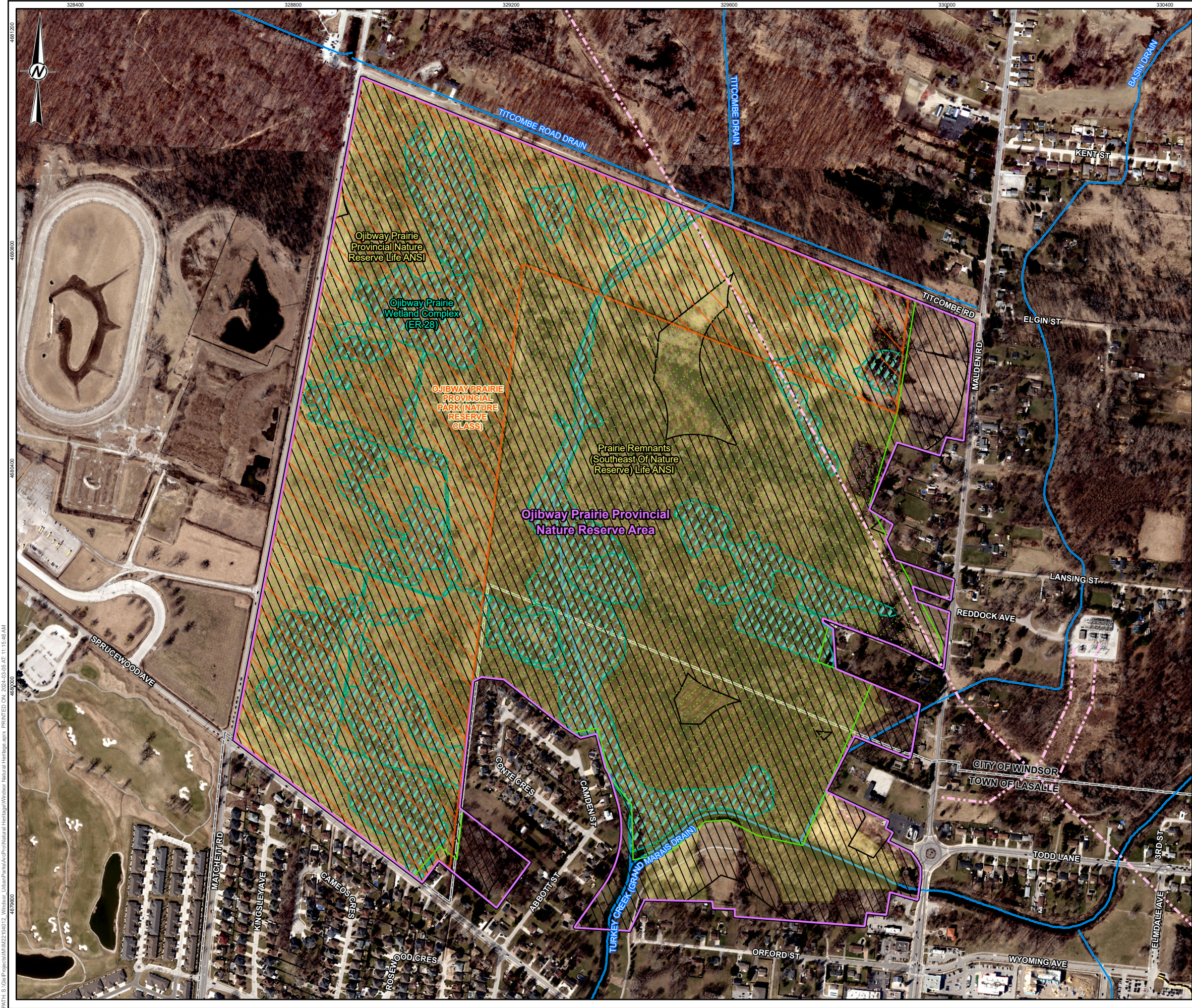
The following rare communities were identified and mapped in the Ojibway Prairie Provincial Nature Reserve Area. The rarity ranks for the vegetation community are in accordance with those identified by the NHIC. The Ojibway Prairie Provincial Nature Reserve Area contains seven vegetation communities that are ranked provincially significant, including four communities that are also ranked globally significant:

- Fresh – Moist Tallgrass Prairie Type (TPO2-1; G2/S1)
- Dry Black Oak Tallgrass Savannah Type (TPS1-1; G3/S1)
- Fresh – Moist Black Oak – White Oak Tallgrass Woodland Type (TPW2-1; G2/S1)
- Dry – Fresh Black Oak Deciduous Forest Type (FOD1-3; G4?/S3)
- Dry – Fresh Oak – Hickory Deciduous Forest Type (FOD2-2; G4?/S3S4)
- Fresh – Moist Black Walnut Lowland Deciduous Forest Type (FOD7-4; G4?/S2S3)
- Pin Oak Mineral Deciduous Swamp Type (SWD1-3; G2/S2S3)

Together, these vegetation communities comprise 61.98 ha or 45.51% of the Ojibway Prairie Provincial Nature Reserve Area (Table 3-20).

Further to the communities listed above, it is important to note that with management to remove woody invasive and exotic species, the successional Mineral Cultural Thicket/Fresh – Moist Tallgrass Prairie Type and Fresh – Moist Tallgrass Savannah Ecosite could be restored to rare tallgrass community types. If this were to occur, an additional 24.15 ha (17.34%) of rare vegetation communities could be re-established in the Ojibway Prairie Provincial Nature Reserve Area (Table 3-20).

Lastly, in addition to the rare plant communities above, the Ojibway Prairie Provincial Nature Reserve Area also contains land with other environmentally significant designations, including a portion of the provincial Ojibway Prairie Wetland Complex (PSW), Prairie Remnants (Southeast of Nature Reserve) Life ANSI, Ojibway Prairie Nature Reserve Life ANSI, and an Environmentally Significant Area regulated by ERCA (Figure 3-16).



LEGEND

- NATURAL HERITAGE REVIEW BOUNDARY
- REGULATION AREA (ESSEX REGION CONSERVATION AUTHORITY)
- ENVIRONMENTALLY SIGNIFICANT AREA
- EVALUATED PROVINCIAL WETLAND (LAND INFORMATION ONTARIO, 2021)
- LIFE ANSI (LAND INFORMATION ONTARIO, 2021)
- PROVINCIAL PARK
- MUNICIPAL DRAIN
- OVERHEAD UTILITY LINE/UTILITY CORRIDOR

REFERENCE(S)

COUNTY OF ESSEX, IMAGERY SERVICE: COUNTY 2022 AIRPHOTO, COUNTY 2021 AIRPHOTOMAP DATA © OPENSTREETMAP CONTRIBUTORS, MICROSOFT, FACEBOOK, INC. AND ITS AFFILIATES, ESRI COMMUNITY MAPS CONTRIBUTORS, MAP LAYER BY ESRI. LAND INFORMATION ONTARIO. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE – ONTARIO, CANADA. PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N.

CLIENT

THE CITY OF WINDSOR
ONTARIO, CANADA

PROJECT

PROPOSED NATIONAL URBAN PARK IN WINDSOR
OJIBWAY PRAIRIE COMPLEX
NATURAL HERITAGE REVIEW REPORT

TITLE

DESKTOP NATURAL HERITAGE REVIEW
OJIBWAY PRAIRIE PROVINCIAL NATURE RESERVE AREA

CONSULTANT	YYYY-MM-DD	2024-03-05
DESIGNED	SS	
PREPARED	HB	
REVIEWED		
APPROVED		

PROJECT NO.	CONTROL	REV.	FIGURE
IM22104012		C	3-16

3.2.6.3 Significant Trees

The composition of large, old trees (>50 cm DBH) in the Ojibway Prairie Provincial Nature Reserve Area is presented in Table 3-22 and Figure 3-17. There are eight species with individuals measuring over 50 cm DBH. The most frequently sampled species was Black Oak (58%), followed by Swamp Pin Oak (19%) and White Oak (10%). Together with a couple Bur Oak trees, Oak species comprised the greatest proportion (89%) of large-diameter trees. Pignut Hickory comprised 6% of large-diameter trees sampled, followed by Black Cherry, Silver Maple and Eastern Cottonwood in smaller numbers (Table 3-22, Figure 3-17).

Large Oaks ranged in age from approximately 59 (Swamp Pin Oak) to >230 yrs old (Black Oak). The average age of large-diameter tree species is presented in Table 3-22 and Figure 3-18. The oldest tree species on average was Pignut Hickory (averaging 171 yrs old), followed by White Oak (153 yrs old), Black Oak (130 yrs old) and Black Cherry (127 yrs old).

The large trees sampled are present within the Oak – Hickory Deciduous Forest, Oak Tallgrass Woodland and Poplar Deciduous Forest.

Table 3-22: Composition of Large Tree Species (>50 cm DBH) Present in Ojibway Prairie Provincial Nature Reserve Area

Common Name	Scientific Name	S-Rank	No. Recorded	Tree Size (cm DBH)			Estimate of Tree Age (yr)		
				Min.	Max.	Average DBH (±SE)	Min.	Max.	Average Age (±SE)
Silver Maple	<i>Acer saccharinum</i>	S5	2	76.3	114.0	95.2 (±18.9)	90	135	112 (±22)
Pignut Hickory	<i>Carya glabra</i>	S3	5	53.0	62.0	57.9 (±1.5)	156	183	171 (±4)
Eastern Cottonwood	<i>Populus deltoides</i>	S5	1		131.3			103	
Black Cherry	<i>Prunus serotina</i>	S5	2	64.0	65.4	64.7 (±0.7)	126	129	127 (±1)
White Oak	<i>Quercus alba</i>	S5	9	52.0	116.3	77.5 (±7.2)	102	229	153 (±14)
Bur Oak	<i>Quercus macrocarpa</i>	S5	2	55.5	57.5	56.5 (±1.0)	109	113	111 (±2)
Swamp Pin Oak	<i>Quercus palustris</i>	S4	17	50.0	73.5	61.3 (±1.8)	59	87	72 (±2)
Black Oak	<i>Quercus velutina</i>	S4	53	53.0	151	82.3 (±2.7)	83	238	130 (±4)
Total Number of Large Trees Sampled			91						

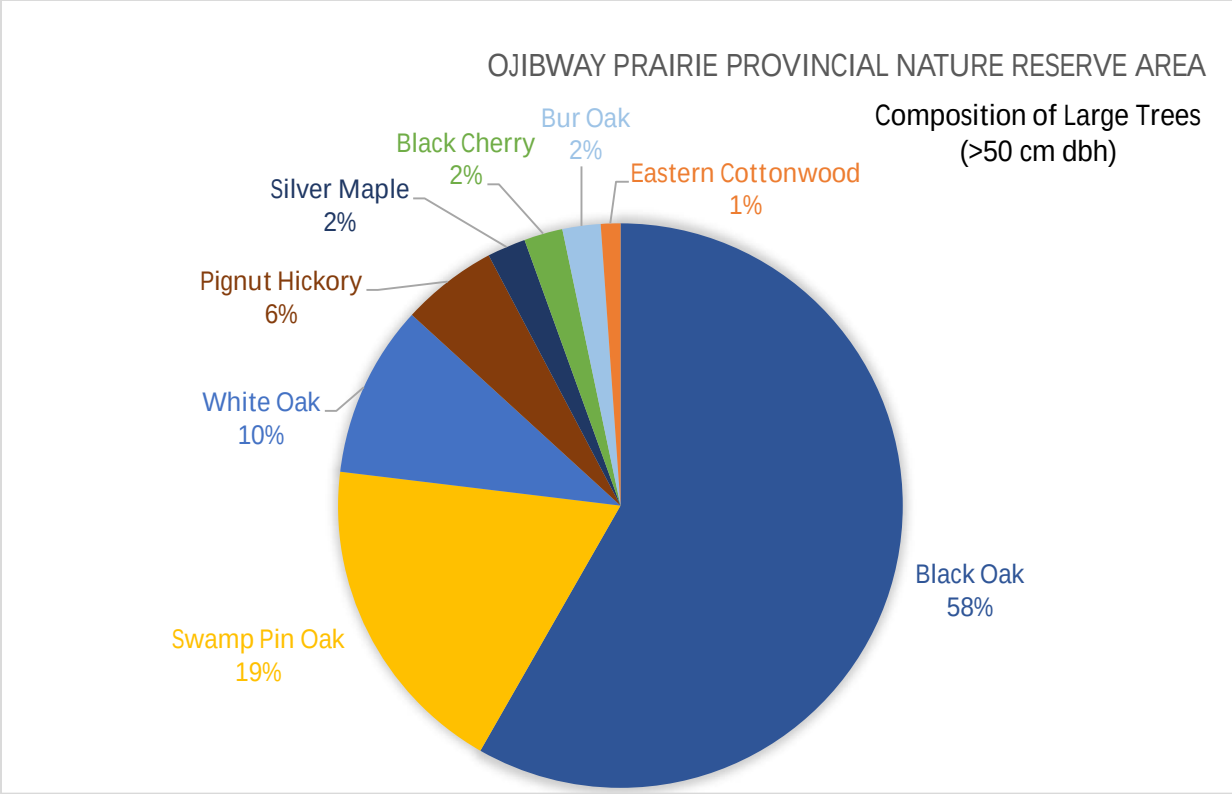


Figure 3-17: Composition of Large Tree Species (>50 cm DBH) in Ojibway Prairie Provincial Nature Reserve Area

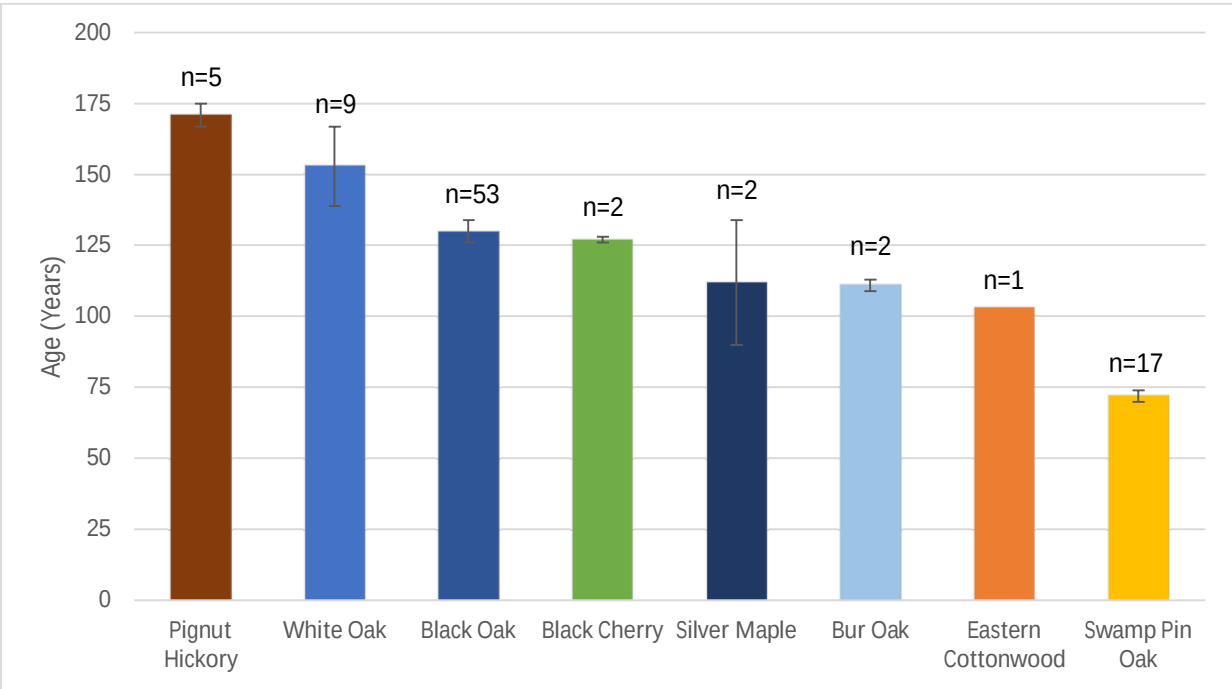


Figure 3-18: Average Age of Large Trees in Ojibway Prairie Provincial Nature Reserve Area

3.2.6.4 Plant SAR and Provincially Rare Species

WSP completed a desktop review of rare species observations in the Ojibway Prairie Provincial Nature Reserve Area (Pratt, 1979; MNRF, 2021a and 2021b; and Ojibway Nature Centre staff). Numerous provincially rare species and SAR have been documented, although what is publicly available and not redacted in government documentation may represent only a portion of the rare plant diversity present in the Nature Reserve Area. In addition, citizen science is very popular in the Nature Reserve Area and as a result, many people post their sightings to publicly available scientific databases such as iNaturalist. A review of these sources indicates approximately 69 rare species have been observed in the Nature Reserve Area, including eight SAR.

In surveys conducted by WSP in summer 2022, previously recorded SAR were again observed.

Lastly, in addition to the species known to occur in the Nature Reserve Area, a review of secondary source information from the NHIC and rare species lists compiled for the entire Ojibway Prairie Complex indicate that many more provincially rare species (including SAR) may occur within and/or around the Nature Reserve Area where suitable habitat exists (Appendix B).

Table 3-23: Plant SAR and Provincially Rare Species Observed in Ojibway Prairie Provincial Nature Reserve Area

(Removed to protect sensitive information)

3.2.6.5 Invasive Exotic Species

Many of the non-native species known to occur in the Ojibway Prairie Provincial Nature Reserve Area can be further characterized as invasive or aggressive species (Table 3-24; Urban Forest Associates Inc., 2002). These species, if left unchecked, have the potential to become dominant in the landscape and threaten native biodiversity. Below is a list of Category 1 to 3 invasive exotic species that are recommended for population monitoring. These species are most likely to require targeted management to keep populations under control or to eradicate them entirely.

Table 3-24: Select Invasive Exotic Species in Ojibway Prairie Provincial Nature Reserve Area

Common Name	Scientific Name	Category No. ¹
Autumn Olive	<i>Elaeagnus umbellata</i>	1
Sweet White Clover	<i>Melilotus alba</i>	2
White Mulberry	<i>Morus alba</i>	1
European Reed	<i>Phragmites australis</i> ssp. <i>australis</i>	1
European Buckthorn	<i>Rhamnus cathartica</i>	1
Black Locust	<i>Robinia pseudo-acacia</i>	2

Common Name	Scientific Name	Category No. ¹
Multiflora Rose	<i>Rosa multiflora</i>	1

Notes: ¹ Category 1 (aggressive invasive); Category 2 (highly invasive but niche-specific); and Category 3 (moderately invasive but can become locally dominant when the proper conditions exist).

3.2.7 SPRING GARDEN NATURAL AREA

The Spring Garden Natural Area (the Natural Area) is approximately 198 ha and is the largest natural area of the Ojibway Prairie Complex. It is bound by Spring Garden Road to the north, Highway 401/Rt. Hon. Herb Gray Parkway (Parkway) to the east, Todd Lane to the south and Malden Road to the west (Figure 1-1). The City acquired approximately 134 ha of property from 1999 to 2008 after Council approved the change from a residential to natural heritage designation for the area in the City of Windsor's Official Plan (OP). The remaining lands within the illustrated boundary are held privately or currently owned and actively managed by the Ministry of Transportation (MTO). The MTO-owned lands adjacent to the Parkway are planned for future inclusion into the Spring Garden Natural Area. The Natural Area includes trails for pedestrian access and passive recreational use, and a constructed shallow marsh.

Natural heritage evaluations of the Spring Garden Natural Area began in the late 1970s (Pratt, 1979) and early 1980s (Oldham, 1983) as part of long-range conservation planning and inventory and analysis of the Ojibway Prairie Complex and Environmentally Significant Areas. At the time, Spring Garden Natural Area was described as having portions of open grassland and meadow with excellent representation of tallgrass prairie species. Other parts of the site were native thicket, and there were portions of upland oak woodland and oak forest as well. In Candidate Natural Heritage Site surveys completed by ERCA in 1992, the prairies were noted to be some of the best remnants in Essex County and the site contained the only dry-phase prairie remnant in Windsor (ERCA, 1992). The City also completed an Environmental Evaluation Report in 1996 as part of their natural heritage planning process which included vegetation mapping and an inventory of plants and wildlife in the Spring Garden Natural Area (City of Windsor, 1996).

Most recently, from 2008 to 2016, vegetation mapping and plant and wildlife surveys were periodically conducted as part of the Parkway project approval and development. The results of these surveys noted that the traditional, open tallgrass communities that were once dominant in the site were being lost to natural succession, dominance of invasive exotic species, and lack of vegetation management (LGL 2011; LGL and Sage Earth 2016).

WSP completed an updated ELC vegetation community mapping of the Spring Garden Natural Area on July 11-15, 2022. Results indicate the presence of 40 natural ELC Vegetation Types in 23 Community Series (Table 3-25, Figure 3-19). These vegetation types represent those described in Lee et al., 1998. In addition, there is one anthropogenic Community Series present, Transportation and Utilities, that better represents those described in Lee, 2008. Based on these results, the Spring Garden Natural Area can be described as having very high vegetation community diversity.

The ELC vegetation communities are comprised of 65.03% (128.52 ha) terrestrial habitat and 27.75% (54.84 ha) wetland habitat (Table 3-26). In addition, there are transitional habitats comprising both terrestrial (i.e., tallgrass prairie and forest) and wetland (i.e., marsh and swamp) community characteristics (7.10% or 14.04 ha).

Terrestrial habitat is comprised of herbaceous plant community series (Open Tallgrass Prairie and Cultural Meadow) and woody plant community series including Tallgrass Savannah and Woodland, Deciduous Forest and Cultural Thicket, Savannah, and Woodland. Wetlands are comprised of Shallow Marsh, Deciduous Swamp and Thicket Swamp communities. There is also one Shallow Aquatic community. Based on the area associated with these communities, the Spring Garden Natural Area can be characterized primarily as cultural (26.72% or 52.80 ha) and forest habitats (26.02% or 51.43 ha), followed by swamp habitats (24.29% or 48.01 ha), and tallgrass ecosystems (12.29% or 24.29 ha).

A description of the dominant ELC vegetation communities in the Spring Garden Natural Area is provided below. The ELC vegetation community mapping results are shown in Figure 3-19.

Table 3-25: Spring Garden Natural Area ELC Vegetation Community Diversity

Community Class	Community Series	ELC Code	Ecosite / Vegetation Type	G-rank	S-rank	Area (ha)	%
Tallgrass Prairie, Savannah and Woodland	Open Tallgrass Prairie	TPO1-1	Dry Tallgrass Prairie Type	G3	S1	3.35	1.70
		TPO2-1	Fresh – Moist Tallgrass Prairie Type	G2	S1	4.98	2.52
	Open Tallgrass Prairie/ Cultural Thicket	TPO2-1/ CUT1	Fresh – Moist Tallgrass Prairie Type/ Cultural Thicket			5.33	2.70
	Tallgrass Savannah	TPS2	Fresh – Moist Tallgrass Savannah Ecosite			0.10	0.05
		TPS2-1	Fresh – Moist Pin Oak – Bur Oak Tallgrass Savannah Type	G1	S1	2.97	1.50
	Tallgrass Woodland	TPW2-1	Fresh – Moist Black Oak – White Oak Tallgrass Woodland Type	G2	S1	6.28	3.18
		TPW2-2	Fresh – Moist Pin Oak Tallgrass Woodland Type	G1	S1	1.28	0.65

Community Class	Community Series	ELC Code	Ecosite / Vegetation Type	G-rank	S-rank	Area (ha)	%
Forest	Deciduous Forest	FOD1-3	Dry – Fresh Black Oak Deciduous Forest Type	G4?	S3	4.57	2.31
		FOD2	Dry – Fresh Oak – Maple – Hickory Deciduous Forest Ecosite			19.63	9.93
		FOD2-2	Dry Oak – Hickory Deciduous Forest Type	G4?	S3S4	0.83	0.42
		FOD4	Dry – Fresh Deciduous Forest Ecosite			0.48	0.24
		FOD7	Fresh – Moist Lowland Deciduous Forest Ecosite			1.12	0.57
		FOD7-3	Fresh – Moist Willow Lowland Deciduous Forest Type			0.22	0.11
		FOD7-4/ FOD1-3	Fresh – Moist Black Walnut Lowland Deciduous Forest Type/ Dry – Fresh Black Oak Deciduous Forest Type	G4? G4?	S2S3 S3	2.73	1.38
		FOD8-1	Fresh – Moist Poplar Deciduous Forest Type			10.43	5.28
		FOD8-2	Fresh – Moist Sassafras Deciduous Forest Type			6.50	3.29
		FOD9	Fresh – Moist Oak – Maple – Hickory Deciduous Forest Ecosite			3.39	1.71

Community Class	Community Series	ELC Code	Ecosite / Vegetation Type	G-rank	S-rank	Area (ha)	%
	Deciduous Forest/Cultural Woodland	FOD8-1/ CUW1	Fresh – Moist Poplar Deciduous Forest Type/ Mineral Cultural Woodland Ecosite			1.54	0.78
Cultural	Cultural Meadow	CUM1	Mineral Cultural Meadow Ecosite			0.49	0.25
		CUM1-1	Dry – Moist Old Field Meadow Type			21.21	10.73
	Cultural Meadow/ Open Tallgrass Prairie	CUM1-1/ TPO1-1	Dry – Moist Old Field Meadow Type/ Dry – Fresh Tallgrass Prairie Type			2.84	1.44
		CUM1-1/ TPO2-1	Dry – Moist Old Field Meadow Type/ Fresh – Moist Tallgrass Prairie Type			0.71	0.36
	Cultural Meadow/ Cultural Thicket	CUM1-1/ CUT1	Dry – Moist Old Field Meadow Type/ Cultural Thicket			2.30	1.16
	Cultural Thicket	CUT1	Mineral Cultural Thicket			6.29	3.18
	Cultural Thicket/ Open Tallgrass Prairie	CUT1-4/ TP02-1	Gray Dogwood Cultural Thicket Type/ Fresh – Moist Tallgrass Prairie Type			3.64	1.84
	Cultural Savannah	CUS1	Mineral Cultural Savannah			4.65	2.35
	Cultural Woodland	CUW1	Mineral Cultural Woodland			10.67	5.40
Swamp	Deciduous Swamp	SWD	Deciduous Swamp			7.75	3.92
		SWD1	Oak Mineral Deciduous Swamp Ecosite			9.23	4.67

Community Class	Community Series	ELC Code	Ecosite / Vegetation Type	G-rank	S-rank	Area (ha)	%
Swamp	Deciduous Swamp	SWD1-1	Swamp White Oak Mineral Deciduous Swamp Type	G1G2	S2S3	2.05	1.04
		SWD1-3	Pin Oak Mineral Deciduous Swamp Type	G2	S2S3	8.75	4.43
		SWD3-2	Silver Maple Mineral Deciduous Swamp Type			7.34	3.71
		SWD4-5	Poplar Mineral Deciduous Swamp Type			4.96	2.51
	Thicket Swamp	SWT2	Mineral Thicket Swamp Ecosite			2.05	1.04
	Thicket Swamp/ Deciduous Swamp	SWT2-8/ SDW1-3	Silky Dogwood Mineral Thicket Swamp Type/ Pin Oak Mineral Deciduous Swamp Type	G5 G4	S3/S4 S2/S3	5.87	2.97
Marsh	Meadow Marsh	MAM2	Mineral Meadow Marsh Ecosite			1.13	0.57
	Shallow Marsh	MAS2	Mineral Shallow Marsh Ecosite			2.58	1.30
Shallow Water		SA				3.12	1.58
Transitional (Terrestrial/ Wetland)	Open Tallgrass Prairie/ Meadow Marsh	TPO2-1/ MAM2-1	Fresh – Moist Tallgrass Prairie Type/ Bluejoint Mineral Meadow Marsh Type			2.3	1.17
	Deciduous Forest/ Thicket Swamp	FOD8-1/ SWT2-9	Fresh – Moist Poplar Deciduous Forest Type/ Gray Dogwood Mineral Thicket Swamp Type			1.92	0.97

Community Class	Community Series	ELC Code	Ecosite / Vegetation Type	G-rank	S-rank	Area (ha)	%
Transitional (Terrestrial/Wetland)	Thicket Swamp/ Deciduous Forest	SWT2-8/ FOD8	Silky Dogwood Mineral Thicket Swamp Type/ Fresh – Moist Poplar – Sassafras Deciduous Forest Ecosite			0.34	0.17
	Deciduous Swamp/ Deciduous Forest	SWD1-3/ FOD2	Pin Oak Mineral Deciduous Swamp Type/ Dry – Fresh Oak – Maple – Hickory Deciduous Forest Ecosite			9.48	4.80
Constructed*	Transportation and Utilities	CVI-1	Transportation			0.24	0.12
Total						197.64	100

Notes: * Indicates an anthropogenic community series as described in Lee, 2008.

Table 3-26: Spring Garden Natural Area ELC Community Class Statistics

ELC Community Class	Area (ha)	Proportion (%)
Terrestrial	128.52	65.03
Tallgrass Prairie, Savannah and Woodland	24.29	12.29
Forest	51.43	26.02
Cultural	52.80	26.72
Wetland	51.72	26.17
Swamp	48.01	24.29
Marsh	3.71	1.88
Aquatic	3.12	1.58
Shallow Water	3.12	1.58
Transitional (Terrestrial/Wetland)	14.04	7.10
Tallgrass Prairie/Marsh	2.30	1.16
Forest/Swamp	11.74	5.94
Anthropogenic	0.24	0.12
Constructed	0.24	0.12
Total	197.64	100

3.2.7.1 ELC Community Descriptions

There are 10 different forest communities in the Spring Garden Natural Area. The largest by area is Dry – Fresh Oak – Maple – Hickory Deciduous Forest (FOD2), followed by Fresh – Moist Poplar Deciduous Forest (FOD8-1) and Fresh – Moist Sassafras Deciduous Forest Type (FOD8-2).

Dry – Fresh Oak – Maple – Hickory Deciduous Forest is found frequently across the Spring Garden Natural Area. The canopy contains a variety of Oak species, including Black Oak, Swamp Pin Oak, Swamp White Oak and White Oak. Pignut Hickory and Silver Maple are common, along with Eastern Cottonwood and Sassafras (>25 m in height; 25-60% cover). The subcanopy contains similar species, as well as Black Cherry (2-10 m or 10-25 m depending on location; 10-25% or 25-60% cover depending on location). The understory contains native and exotic shrubs and small trees (1-2 m in height; 10-25% cover) and the groundcover layer is comprised primarily of Sedges, Creeper, Multiflora Rose and Spotted Geranium (0.2-0.5 m in height; >60% cover).



Photo 3-26: Dry – Fresh Oak – Maple – Hickory Deciduous Forest (FOD2)

The age of this forest type is estimated to be mid-aged to mature based on the size and composition of the tree species. Vernal pools, an abundance of fallen logs and potential hibernacula provide habitat for wildlife.

Soil analysis characteristics indicate a few different moisture levels, ranging from moderately fresh, moist to very moist, depending on location. Soil texture is also variable and includes silty clay, clay loam and loamy sand. Depth of the organic layer is 1 cm throughout. The depth to mottles ranged from 25-45 cm and gleys were found in one location at 65 cm deep. Depth to bedrock is >120 cm.

The Fresh – Moist Poplar Deciduous Forest has a canopy dominated by Eastern Cottonwood or Large-toothed Aspen (in one location) with Black Cherry, Black Oak, Swamp Pin Oak, and Silver Maple also present (>25 m in height; >60% cover). Where Large-toothed Aspen is dominant, the subcanopy contains abundant Sassafras and occasional Black Cherry and Large-toothed Aspen (2-10 m in height; 25-60% cover) and the understory contains small Sassafras (1-2 m in height; 0-10% cover). Where Eastern Cottonwood is dominant, the subcanopy contains Silver Maple and Swamp Pin Oak (2-10 m in height; 25-60% cover) and the understory is comprised of abundant Ash (*Fraxinus* sp.) and occasional American Elm, Swamp Pin Oak, and native Dogwood species (1-2 m in height; 25-60% cover). Sedges,

Goldenrods, Virginia Creeper and small woody shrubs are common in the groundcover layer (0.2-0.5 m in height; between 25-60% or >60% cover depending on location).

The Poplar Deciduous Forest community is estimated to be mid-aged based on the size and composition of the tree species. Where Sassafras is abundant in the subcanopy and understory, this community may eventually succeed to a Sassafras Deciduous Forest. The soil analysis characteristics indicate this community has a mineral soil substrate of dry-fresh sandy loam. The depth of the organic layer is 1 cm and there are no mottles or gleys. Depth to bedrock is >120 cm.

It is important to note that the Fresh – Moist Poplar Deciduous Forest is occasionally found in combination with other community types, specifically Mineral Cultural Woodland (CUW1) and Grey Dogwood Mineral Deciduous Thicket Swamp (SWT2-9). These areas can be described as transitional and share characteristics of both vegetation community types. For example, in the FOD8-1/SWT2-9 community, Eastern Cottonwood and Trembling Aspen have grown large enough to reach canopy and subcanopy height; however, tree cover is not dense enough to be characterized a forest, and Grey Dogwood dominates the understory with >60% cover. These situations do sometimes occur given the high diversity of different vegetation communities in the natural area.

The Fresh – Moist Sassafras Deciduous Forest Type has a canopy dominated by Sassafras with occasional Eastern Cottonwood, Trembling Aspen, Large-toothed Aspen and Black Oak (>25% in height; >60% cover). The subcanopy is also primarily Sassafras with some Black Cherry and Red Maple (2-10 m or 10-25 m in height depending on location; 25-60% cover). The understory contains shrubs and small trees such as American Hazelnut, Black Cherry, Grey Dogwood and Multiflora Rose (1-2 m or 2-10 m in height; 0-10% or 10-25% cover depending on location). Sedges, Goldenrods, Virginia Creeper, Bracken Fern, Royal Fern and Blackberries are common in the groundcover layer (0.2-0.5 m in height; >60% cover).



Photo 3-27: Fresh – Moist Sassafras Deciduous Forest (FOD8-2)

The age of the Sassafras Deciduous Forest community ranges from mid-aged to mature based on the size and composition of the tree species. Soil analysis characteristics indicate a variety of mineral soil substrates, including fresh loam, fresh sandy loam, and dry-fresh sandy loam. The depth of the organic layer is 1 cm throughout. Mottles and gleys were not observed. The depth to bedrock is >120 cm.

There are several different swamp communities mapped in the Spring Garden Natural Area. The largest communities by area comprise Oak-dominated deciduous swamps, such as Pin Oak Mineral Deciduous Swamp (SWD1-3), followed by Silver Maple Mineral Deciduous Swamp (SWD3-2).

The Pin Oak Mineral Deciduous Swamp has a canopy dominated by Swamp Pin Oak. Other Oaks including Swamp White Oak, White Oak and Black Oak are also present, but in lesser amounts. Silver Maple, Eastern Cottonwood and Pignut Hickory may also occur in the canopy layer (>25 m in height; 25-60% or >60% cover depending on location). The subcanopy is mostly Swamp Pin Oak, Swamp White Oak, Silver Maple, and the addition of Black Cherry (10-25 m in height; 10-25% or 25-60% cover depending on location). Eastern Buttonbush is very common in the understory, as are Dogwoods (Grey and Silky Dogwood) and American Hazelnut (1-2 m or 2-10 m in height; 10-25% cover or >60% cover in the youngest swamp area). Invasive exotic Autumn Olive and European Reed are also noted in the understory. The groundcover layer is dominated by Ferns and Sedges, including Bracken Fern, Royal Fern, Marsh Fern and Pennsylvania Sedge (0.2-0.5 m in height; 25-60% or >60% cover).



Photo 3-28: Pin Oak Mineral Deciduous Swamp (SWD1-3)

Age of the Pin Oak Mineral Deciduous Swamp community ranges from mid-aged to mature based on the size and composition of the tree species. There is abundant vernal pool habitat, fallen logs and potential wildlife hibernacula throughout these sites. Microtopography changes and seasonal flooding has resulted in little groundcover establishment in low-lying spots and drier Black Oak establishment on higher mounds.

The Silver Maple Mineral Deciduous Swamp canopy is dominated by Silver Maple and Eastern Cottonwood with an occasional Swamp Pin Oak (>25 m in height; >60% cover). The subcanopy is primarily Silver Maple, but Manitoba Maple, Red Ash and American Elm are also common (10-25 m in height; 10-25% or 25-60% cover depending on location). The understory is dominated by Grey Dogwood, Silky Dogwood, Eastern Buttonbush and regenerating Red Ash and Silver Maple (1-2 m or 2-10 m in height; 25-60% cover). The groundcover layer contains Fowl Mannagrass, Virginia Creeper, Poison Ivy, various Sedges, Broad-leaved Enchanter's Nightshade, False Nettle, Swamp Agrimony and Royal Fern (0.2-0.5 m in height; 25-60% or >60% cover depending on location).

The age of the Silver Maple Mineral Deciduous Swamp community ranges from mid-aged to mature based on the size and composition of the tree species. There is abundant vernal pool habitat throughout these sites. The soil analysis characteristics indicate a mineral soil substrate with an overall moisture regime of fresh to fresh-moist. Soil texture is a sandy loam to sandy clay loam depending on location. The depth of the organic layer is 1-30 cm depending on location. Mottles were present in one location only, at 20 cm depth. No gleys were observed. The depth to bedrock is >120 cm.



Photo 3-29: Silver Maple Mineral Deciduous Swamp (SWD3-2)

There are seven different cultural-based communities mapped in the Spring Garden Natural Area. The largest community by area is the Dry – Moist Old Field Meadow (CUM1-1), followed by Mineral Cultural Woodland (CUW1) and Mineral Cultural Thicket (CUT1).

The Dry – Moist Old Field Meadows in Spring Garden Natural Area are a mix of exotic cool-season grasses and forb species. The groundcover layer contains dominant to abundant cover of Orchard Grass, Redtop and Smooth Brome. Forbs include Canada Thistle, Common Crown-vetch, Wild Parsnip, Red Clover, and occasional Common Milkweed (0.2-0.5 m or 0.5-1 m in height depending on location; >60% cover). Woody species can be common in the understory layer, such as Dogwoods, Autumn Olive, Multiflora Rose and American Hazelnut (1-2 m in height; 0-10% or 10-25% cover depending on location). Occasionally there are mature trees in the subcanopy and/or canopy layer (10-25 m in height; 0-10% cover).

The soil analysis characteristics indicate a mineral soil substrate with an overall moisture regime of dry-fresh to fresh. Soil texture varies from silty sand, sandy loam/silty sand and sandy clay loam depending on location. The depth of the organic layer is 1-20 cm depending on location. Mottles were present at a depth of 40 cm. No gleys were observed. The depth to bedrock is >120 cm.

In general, the floristic quality of these Dry – Moist Old Field Meadows is poor except where they are found in combination with remnant tallgrass prairie species. These areas are mapped as Dry – Moist Old Field Meadow (CUM1-1)/Dry-Fresh Tallgrass Prairie Type (TPO1-1) and Dry – Moist Old Field Meadow (CUM1-1)/Fresh – Moist Tallgrass Prairie Type (TPO2-1).

In these mixed communities, a greater diversity of native forb species is found in the groundcover layer, including Wild Bergamot, Butterfly Milkweed, Round-headed Bush-clover and Goldenrods. The grass component still tends to be dominated by cool-season species, but occasional Big Bluestem, Yellow Indiangrass and Old Switch Panicgrass are also present (0.2 to 0.5 or 0.5-1 m in height depending on location; >60% cover). Autumn Olive, Grey Dogwood and Multiflora Rose are usually present in the understory and are quite dense in some areas (1-2 m in height; 25-60% cover).



Photo 3-30: Dry – Moist Old Field Meadow (CUM1-1)/ Fresh – Moist Tallgrass Prairie Type (TPO2-1)

Mineral Cultural Woodlands exist at the edges of the natural area and are dominated by Eastern Cottonwood in the canopy (>25 m in height; 25-60% cover) and a variety of different species in the subcanopy, including Swamp Pin Oak, White Mulberry, Black Cherry and Black Walnut (10-25 m in height; 10-25% cover). The understory contains shrubs and small trees, some of which are considered invasive exotic species like Autumn Olive and Manitoba Maple (1-2 m in height; 25-60% cover). Cool-season grasses and common forb species are found in the groundcover layer, such as Orchard Grass, Goldenrods, Philadelphia Fleabane, Virginia Creeper, Broad-leaved Enchanter's Nightshade and Riverbank Grape (0.5-1 m in height; >60% cover).

The age of the Cultural Woodland community is relatively young based on the size and composition of the tree species. A young community is one where species have not yet undergone natural thinning and they exist largely as individuals with no strong community interactions among them. Notes taken at the time of ELC surveys indicate that the successional trajectory of this woodland community may be in the direction of a Poplar-dominated forest given the plant species present and soil characteristics. The soil analysis indicates a mineral soil substrate of fresh loam. The depth of the organic layer is 1 cm. There are no mottles or gleys present. The depth to bedrock is >120 cm.

Mineral Cultural Thickets in Spring Garden Natural Area are typically dominated by Autumn Olive and/or native Dogwood species. Other woody species include European Buckthorn, Sumacs, Multiflora Rose and White Mulberry (1-2 m or 2-10 m in height depending on location, >60% cover). Cool-season grasses such as Redtop and Orchard Grass are common and where soil conditions are moist, Reed Canarygrass and European Reed are also present. Like the Old – Field Meadow community, Cultural Thickets frequently contain remnant tallgrass prairie species in the groundcover layer such as Wild Bergamot, Black-eyed Susan, Virginia Mountain-mint and Swamp Agrimony (in moist areas) (0.2-0.5 m or 0.5-1 m in height

depending on location; >60% cover). On occasion there are trees in the subcanopy and/or canopy layers, often Eastern Cottonwood, Manitoba Maple and White Mulberry (>25 m or 10-25 m in height depending on location; 25-60% cover). Vernal pools provide wildlife habitat in this community.

The soil analysis characteristics indicate a mineral soil substrate with an overall moisture regime of dry-fresh to fresh. Soil texture varies between clay loam, sandy loam and sandy clay loam depending on location. The depth of the organic layer is 1 cm. Mottles are present at a depth of 20 cm in one location. No gleys were observed. The depth to bedrock is >120 cm.

There are five rare tallgrass communities in the Spring Garden Natural Area. Fresh – Moist Tallgrass Prairie (TPO2-1) and Fresh – Moist Black Oak – White Oak Tallgrass Woodland (TPW2-1) are the most common throughout the natural area. Dry Tallgrass Prairie Type (TPO1-1), Fresh – Moist Pin Oak – Bur Oak Tallgrass Savannah (TPS2-1) and Fresh – Moist Pin Oak Tallgrass Woodland (TPW2-2) are also present, but from one or two polygons each in the northeastern portion of the site.

The Fresh – Moist Tallgrass Prairies are dominated by a dense groundcover of native grasses and forbs (0.5-1 m in height; >60% cover). Big Bluestem and Yellow Indiangrass are common and abundant and sometimes mixed with Orchard Grass and Redtop. Forb species that characterize these sites include Virginia Mountain-mint, Blue Vervain, and Pale-spike Lobelia. In moister areas of these sites, there are ferns (Royal Fern and Marsh Fern), Bulrushes and Sedges, Rice Cutgrass, Spotted Joe Pye Weed and Swamp Agrimony.

In the Dry Tallgrass Prairies, there is also a dense groundcover of native grasses and forbs (0.5-1 m in height; >60% cover) including Big Bluestem, Yellow Indiangrass and Poverty Oatgrass, but the forb species are dominated by those that prefer slightly drier soil conditions, such as Wild Bergamot, Common and Butterfly Milkweed, Round-headed Bush-clover, and Black-eyed Susan.

In both prairie communities there is shrub encroachment in the understory layer, primarily Autumn Olive and Grey Dogwood. Autumn Olive tends to form thickets very quickly where growth is not managed (noted as TPO2-1/CUT1 on Figure 3-19). Other species recorded in the understory include European Reed and Red Ash. The height of understory vegetation ranged from 1-2 m to 2-10 m depending on location. Cover also ranged from 0-10% to 10-25% depending on location. The canopy and subcanopy layers are open, with exception of an occasional large Eastern Cottonwood (>25 m in height; 0-10% cover).



Photo 3-31: Fresh – Moist Tallgrass Prairie Type (TPO2-1)

Soil analysis characteristics indicate that the tallgrass prairie communities have a mineral soil substrate with a moisture regime of dry-fresh, fresh to moist depending on location. Soil texture varies and includes silty sand, sandy clay loam, sandy loam and loam depending on location. The depth of the organic layer is 1 cm, with exception of one location where it is 10 cm. Mottles are present at a depth of 55 cm in one location. No gleys were observed. The depth to bedrock is >120 cm. Vernal pools are present in some of the prairie communities and provide important wildlife habitat.

Fresh – Moist Black Oak – White Oak Tallgrass Woodland is found in the central portion of Spring Garden Natural Area. Both young and old growth stands are present. The canopy of this community is dominated by Black Oak. However, in the old growth stand, White Oak is also present with occasional Eastern Cottonwood and Red Maple (>25 m in height; 25-60% cover).

In the younger stand, Silver Maple, Swamp Pin Oak and Eastern Cottonwood are present in equal amounts (10-25 m in height; 25-60% cover). Black Cherry is common in the subcanopy of both woodlands (2-10 m or 10-25 m in height depending on location, 10-25% cover).

Red Ash and Gray Dogwood are present in the understory of the old growth woodland (1-2 m in height; 0-10% cover) whereas Autumn Olive, Grey Dogwood and White Mulberry are present in the young woodland (1-2 m in height; 10-25% cover). The groundcover layer in the old growth woodland contains abundant Bracken Fern, American Hog-peanut, Sedges and Virginia Creeper (<0.2 m in height; >60% cover). The groundcover layer in the young woodland is dominated by Goldenrods, abundant Virginia Mountain-mint and occasional Royal Fern and Sedges (0.5-1 m in height; >60% cover).



Photo 3-32: Fresh – Moist Black Oak – White Oak Tallgrass Woodland (Old Growth) (TPW2-1)



Photo 3-33: Fresh – Moist Black Oak – White Oak Tallgrass Woodland (Young) (TPW2-1)

Vernal pools, fallen logs and potential wildlife hibernacula are present in the old growth woodland.

Soil characteristics indicate that this community has a mineral soil substrate of dry-fresh to fresh-moist sandy loam. The depth of the organic layer is 1 cm. Mottles are present at a depth of 40 cm where the soil is fresh-moist (at the southern end of the old growth woodland). No gleys were observed. The depth to bedrock is >120 cm.

A remnant Fresh – Moist Pin Oak Tallgrass Woodland is found in the northern portion of the natural area. The canopy contains abundant Black Oak and Swamp Pin Oak, followed by Trembling Aspen, Black Cherry and Eastern Cottonwood (>25 m in height; 25-60% cover). The subcanopy contains abundant Black Cherry and occasional Black Oak (10-25 m in height; 25-60% cover). Autumn Olive and Grey Dogwood are present in the understory (2-10 m in height; 10-25% cover). Abundant, small Autumn Olive is also present in the groundcover layer with Sedges and cool-season grasses (0.5-1 m in height; >60% cover).

A Fresh – Moist Pin Oak – Bur Oak Tallgrass Savannah is found in the northern portion of the Natural Area. The canopy is dominated by Swamp Pin Oak with lesser amounts of Eastern Cottonwood and Willow species (>25 m in height; 10-25% cover). The subcanopy contains Swamp Pin Oak and Black Cherry (10-25 m in height; 0-10% cover). Swamp Pin Oak is also present in the understory; however, so is Autumn Olive (1-2 m in height; 0-10% cover). The groundcover layer contains tallgrass indicator species including abundant Bluejoint



Photo 3-34: Fresh – Moist Pin Oak – Bur Oak Tallgrass Savannah (TPS2-1)

Reedgrass, Big Bluestem, Wild Bergamot, Common Milkweed, Goldenrods, Bulrushes and Sedges (0.5 – 1 m in height; >60% cover).

The age of this savannah community is estimated to be mature based on the size and composition of the tree species. The soil analysis indicates a mineral soil substrate of moist, silty sand. Depth of the organic layer is 40 cm. No mottles or gleys were observed. The depth to bedrock is >120 cm.

Lastly, it is important to note the restoration work that has been successfully completed in the Mineral Shallow Marsh (MAS2) located in the central portion of the Spring Garden Natural Area.

This marsh was once a constructed milk factory lagoon. When it naturalized, it became heavily infested with European Reed. Beginning in 2019, large scale cutting using a Truxor machine, followed by touch-up cutting and herbicide applications were completed and have nearly eliminated the European Reed infestation. The marsh is now dominated by Nodding Bur-marigold and Rice Cutgrass. Other native species include Narrow-leaved Cattail, Softstem Bulrush, Spotted Joe Pye Weed, Slender False Foxglove, and Allegheny Monkeyflower. On the upland pond edges and along the adjacent trail, Autumn Olive is noted as becoming increasingly dominant.



Photo 3-35: Mineral Shallow Marsh (MAS2)

This Shallow Marsh community is known to provide habitat for several wildlife, including snakes, turtles, and birds.

3.2.7.2 Rare Vegetation Communities

The following rare communities were identified and mapped in the Spring Garden Natural Area. The rarity ranks for the vegetation community are in accordance with those identified by the NHIC. The Spring Garden Natural Area contains 11 vegetation communities that are ranked provincially significant, including six communities that are also ranked globally significant:

- Dry Tallgrass Prairie Type (TPO1-1; G3S1)
- Fresh – Moist Tallgrass Prairie Type (TPO2-1; G2/S1)
- Fresh – Moist Pin Oak – Bur Oak Tallgrass Savannah Type (TPS2-1; G1/S1)
- Fresh – Moist Black Oak – White Oak Tallgrass Woodland Type (TPW2-1; G2/S1)
- Fresh – Moist Pin Oak Tallgrass Woodland Type (TPW2-2; G1/S1)
- Dry – Fresh Black Oak Deciduous Forest Type (FOD1-3; G4?/S3)
- Dry – Fresh Oak – Hickory Deciduous Forest Type (FOD2-2; G4?/S3S4)
- Fresh – Moist Black Walnut Lowland Deciduous Forest Type (FOD7-4; G4?/S2S3)/Dry – Fresh Black Oak Deciduous Forest Type (FOD1-3; G4?/S3)
- Swamp White Oak Mineral Deciduous Swamp Type (SWD1-1; G1G2/S2S3)
- Pin Oak Mineral Deciduous Swamp Type (SWD1-3; G2/S2S3)

- Silky Dogwood Mineral Thicket Swamp Type (SWT2-8; G5/S3S4)/Pin Oak Mineral Deciduous Swamp Type (SWD1-3; G2/S2S3)

Together, these vegetation communities comprise 43.66 ha or 22.10% of the Spring Garden Natural Area (Table 3-25).

In addition to the communities above, there were also mixed remnant tallgrass prairie and cultural community types, some of which were undergoing natural succession. With management to remove invasive and exotic species, and prescribed burning in these areas, an additional 12.52 ha or 6.34% of the Natural Area could be restored to open tallgrass communities:

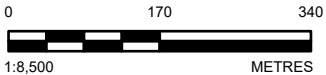
- Dry – Moist Old Field Meadow Type/Dry – Fresh Tallgrass Prairie Type
- Dry – Moist Old Field Meadow Type/Fresh – Moist Tallgrass Prairie Type
- Gray Dogwood Cultural Thicket Type/Fresh – Moist Tallgrass Prairie Type
- Fresh – Moist Tallgrass Prairie Type/Cultural Thicket

Lastly, it is also worth noting that the Spring Garden Natural Area contains two provincially rare thicket swamp communities, Silky Dogwood Mineral Thicket Swamp Type (SWT2-8; G5/S3S4) and Gray Dogwood Mineral Thicket Swamp Type (SWT2-9; G5/S3S4), that are also found in combination with common vegetation community types, Fresh – Moist Poplar – Sassafras Deciduous Forest and Fresh – Moist Poplar Deciduous Forest, respectively. Vegetation management may also be considered necessary and appropriate in these areas to restore the dominance of the Thicket Swamp community characteristics.

Spring Garden Natural Area contains land with other environmentally significant designations as well, including a portion of the provincial Ojibway Prairie Wetland Complex (PSW), Prairie Remnants (Spring Garden Forest) Life ANSI, and an Environmentally Significant Area regulated by ERCA (Figure 3-20).



- LEGEND**
- NATURAL HERITAGE REVIEW BOUNDARY
 - REGULATION AREA (ESSEX REGION CONSERVATION AUTHORITY)
 - ENVIRONMENTALLY SIGNIFICANT AREA
 - EVALUATED PROVINCIAL WETLAND (LAND INFORMATION ONTARIO, 2021)
 - LIFE ANSI (LAND INFORMATION ONTARIO, 2021)
 - MUNICIPAL DRAIN
 - OVERHEAD UTILITY LINE/UTILITY CORRIDOR



REFERENCE(S)
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PROJECT
PROPOSED NATIONAL URBAN PARK IN WINDSOR
OJIBWAY PRAIRIE COMPLEX
NATURAL HERITAGE REVIEW REPORT

TITLE
DESKTOP NATURAL HERITAGE REVIEW
SPRING GARDEN NATURAL AREA

CONSULTANT	YYYY-MM-DD	2024-03-05
	DESIGNED	SS
	PREPARED	HB
	REVIEWED	
	APPROVED	



3.2.7.3 Significant Trees

The composition of large, old trees (>50 cm DBH) in the Spring Garden Natural Area is presented in Table 3-27 and Figure 3-21. There are 17 species with individuals measuring over 50 cm DBH. The most frequently sampled species was Black Oak (38%), followed by Eastern Cottonwood (24%) and Swamp Pin Oak (11%). Large White Oak, Swamp White Oak, Bur Oak and Northern Red Oak were also present, comprising an additional 11% of the trees sampled. In total, Oak species comprised the greatest proportion (60%) of large-diameter trees, followed by Eastern Cottonwood (24%). Other species including Maples (5%), Hickories (4%) and Black Cherry (4%) were present in smaller numbers (Table 3-27, Figure 3-21).

Large Oaks ranged in age from approximately 51 (Swamp Pin Oak) to 232 yrs old (Black Oak). The average age of large-diameter tree species is presented in Table 3-27 and Figure 3-22. The oldest tree species on average was Pignut Hickory (averaging 168 yrs old), followed by Swamp White Oak (130 yrs old), White Oak (128 yrs old) and Black Cherry (122 yrs old). A single Bur Oak individual was estimated to be 179 yrs old. The youngest, large tree species sampled was Large-toothed Aspen, averaging 53 yrs old. Like Eastern Cottonwood, this species is also fast-growing yet has a relatively short typical mortality (70 yrs). Based on the sampling results of both Large-tooth Aspen and Eastern Cottonwood in Spring Garden Natural Area, these large individuals would still be considered relatively “old” for the species.

The large trees sampled are present within Swamp Pin Oak Deciduous Swamp, Oak – Maple – Hickory Deciduous Forest and Poplar – Sassafras Deciduous Forest.

Table 3-27: Composition of Large Tree Species (>50 cm DBH) Present in Spring Garden Natural Area

Common Name	Scientific Name	S-Rank	No. Recorded	Tree Size (cm DBH)			Estimate of Tree Age (yr)		
				Min.	Max.	Average DBH (±SE)	Min.	Max.	Average Age (±SE)
Manitoba Maple	<i>Acer negundo</i>	S5	5	55.1	66	59.9 (±2.2)	43	52	47 (±2)
Silver Maple	<i>Acer saccharinum</i>	S5	8	50.0	90.0	66.7 (±5.5)	59	106	79 (±7)
American Chestnut	<i>Castanea dentata</i>	S1S2	1		39.2			62	
Pignut Hickory	<i>Carya glabra</i>	S3	8	50.0	69.0	56.9 (±2.1)	148	204	168 (±6)
Shagbark Hickory	<i>Carya ovata</i>	S5	1		33.4			99	
Hickory Species	<i>Carya species</i>		1		52			143	
Eastern Cottonwood	<i>Populus deltoides</i>	S5	67	50.0	134.0	72.6 (±2.2)	39	106	57 (±2)
Large-toothed Aspen	<i>Populus grandidentata</i>	S5	5	58.5	74.3	67.4 (±2.7)	46	59	53 (±2)
Black Cherry	<i>Prunus serotina</i>	S5	12	50.0	78.0	62.1 (±3.1)	98	154	122 (±6)
White Oak	<i>Quercus alba</i>	S5	15	50.0	112.0	65.1 (±4.1)	98	220	128 (±8)
Swamp White Oak	<i>Quercus bicolor</i>	S4	13	50.0	96.0	65.8 (±4.0)	98	189	130 (±8)
Bur Oak	<i>Quercus macrocarpa</i>	S5	1		91			179	
Swamp Pin Oak	<i>Quercus palustris</i>	S4	30	51	100.5	69.0 (±2.9)	51	199	82 (±3)
Northern Red Oak	<i>Quercus rubra</i>	S5	3	56	67	60.9 (±3.2)	88	106	96 (±5)
Black Oak	<i>Quercus velutina</i>	S4	106	50.0	147.5	71.5 (±1.7)	79	232	113 (±3)
Crack Willow	<i>Salix fragilis</i>	SNA	1		61.3				48
American Elm	<i>Ulmus americana</i>	S5	3	56.8	83	65.7 (±8.6)	89	131	104 (±14)
Total Number of Large Trees Sampled			281						

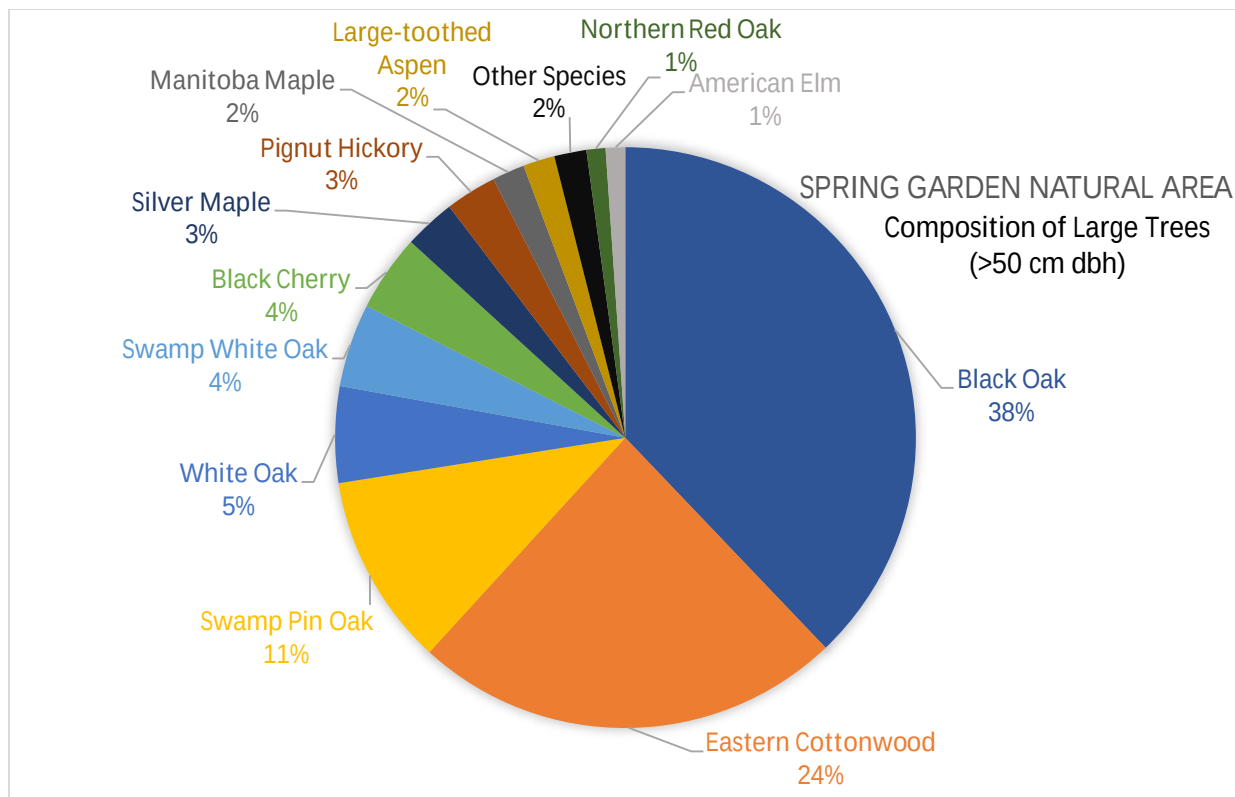


Figure 3-21: Composition of Large Tree Species (>50 cm DBH) in Spring Garden Natural Area

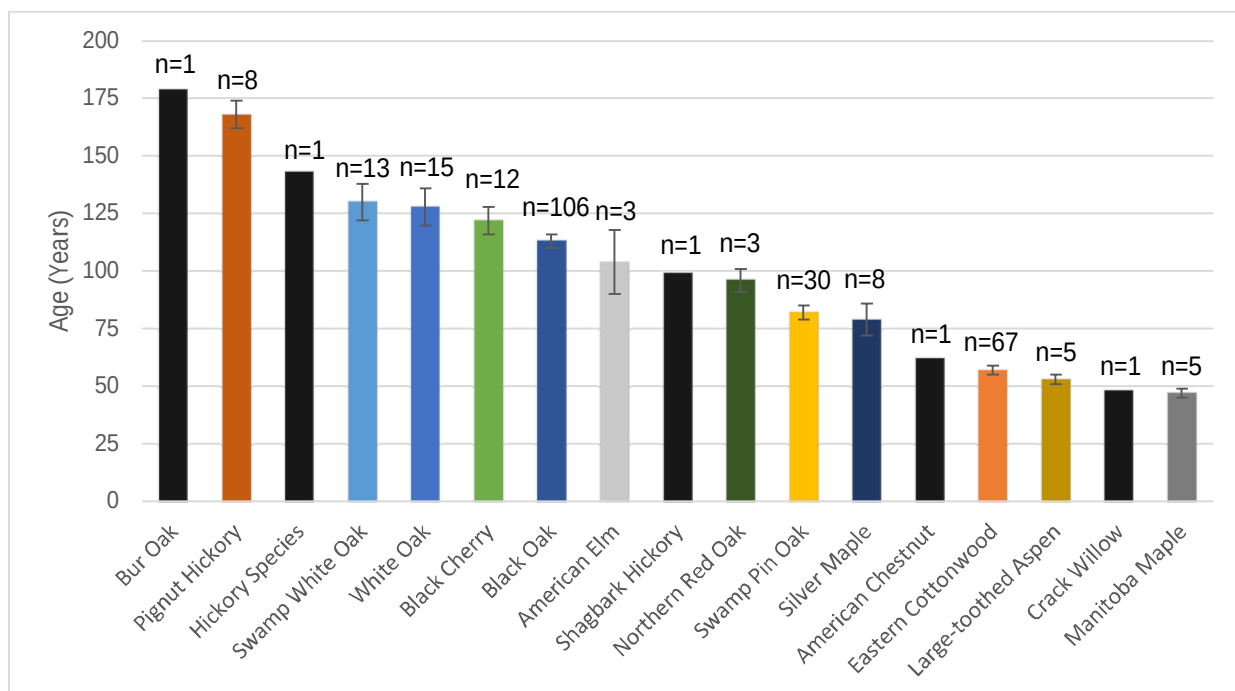


Figure 3-22: Average Age of Large Tree Species in Spring Garden Natural Area

3.2.7.4 Plant SAR and Provincially Rare Species

In field surveys conducted by Pratt (1979); Oldham (1983), ERCA (1992), City of Windsor (1996), LGL Limited and Sage Earth (2016), and Wood (2021b), a total of 74 provincially rare plant species were recorded in the Spring Garden Natural Area, including 10 listed as SAR.

A review of the verified and research grade sightings of rare plants posted to iNaturalist indicate an additional three rare species present in Spring Garden Natural Area.

In surveys conducted by WSP in 2022, several of the previously recorded SAR were observed again, and a new recorded occurrence was documented. Altogether, a total of 78 provincially rare plant species, including 13 listed as SAR have been recorded in the Spring Garden Natural Area (Table 3-28).

Lastly, in addition to the species known to occur in the Natural Area, a review of secondary source information from the NHIC and rare species lists compiled for the entire Ojibway Prairie Complex indicate that additional provincially rare species (including SAR) may occur within and/or around the Natural Area where suitable habitat exists (Appendix B).

Table 3-28: Plant SAR and Provincially Rare Species Observed in Spring Garden Natural Area
(Removed to protect sensitive information)

3.2.7.5 Invasive Exotic Species

Many of the non-native species found in the Spring Garden Natural Area can be further characterized as invasive or aggressive species (Table 3-29; Urban Forest Associates Inc., 2002). These species, if left unchecked, have the potential to become dominant in the landscape and threaten native biodiversity. Below is a list of Category 1 to 3 invasive exotic species that are recommended for population monitoring in the site. These species are most likely to require targeted management to keep populations under control or to eradicate them entirely.

Table 3-29: Select Invasive Exotic Species in Spring Garden Natural Area

Common Name	Scientific Name	Category No. ¹
Manitoba Maple	<i>Acer negundo</i>	1
Norway Maple	<i>Acer platanoides</i>	2
Tree-of-heaven	<i>Ailanthus altissima</i>	1
Garlic Mustard	<i>Alliaria petiolata</i>	1
Spotted Knapweed	<i>Centaurea stoebe</i>	3
Canada Thistle	<i>Cirsium arvense</i>	1
Orchard Grass	<i>Dactylis glomerata</i>	3
Russian Olive	<i>Elaeagnus angustifolia</i>	3
Autumn Olive	<i>Elaeagnus umbellata</i>	1
Glossy Buckthorn	<i>Frangula alnus</i>	1

Common Name	Scientific Name	Category No. ¹
Japanese Honeysuckle	<i>Lonicera japonica</i>	1
Tall Ryegrass	<i>Lolium arundinaceum</i>	3
Purple Loosestrife	<i>Lythrum salicaria</i>	1
Chinese Silvergrass	<i>Miscanthus sinensis</i>	3
White Mulberry	<i>Morus alba</i>	1
Wild Parsnip	<i>Pastinaca sativa</i>	3
European Reed	<i>Phragmites australis</i> ssp. <i>australis</i>	1
Japanese Knotweed	<i>Reynoutria japonica</i>	2
European Buckthorn	<i>Rhamnus cathartica</i>	1
Black Locust	<i>Robinia pseudoacacia</i>	2
Multiflora Rose	<i>Rosa multiflora</i>	1
Purple Crown-vetch	<i>Securigera varia</i>	1
Siberian Elm	<i>Ulmus pumila</i>	2
European Swallowwort	<i>Vincetoxicum rossicum</i>	1

Notes: ¹ Category 1 (aggressive invasive); Category 2 (highly invasive but niche-specific); and Category 3 (moderately invasive but can become locally dominant when the proper conditions exist).

3.2.8 OAKWOOD NATURAL AREA

The Oakwood Natural Area is approximately 28 ha and is located between Pulford Street and Cabana Road W., west of Askin Avenue and east of Highway 401/Highway 3 (Figure 1-1). In 1974 and 1975, the City acquired wooded lots immediately adjacent to the existing Oakwood Park which housed the South Windsor Arena and Community Centre. The wooded land was incorporated into Oakwood Park and left in a natural state. The Oakwood Natural Area includes maintained trails for pedestrian access and passive recreational use.

ERCA performed the first biological inventory of Oakwood Park as a Candidate Natural Heritage Site in the early 1990s. At the time, tallgrass prairie indicator species were found throughout the site, including numerous SAR and provincially rare species. However, the varied soil conditions resulted in the growth of upland hardwood forest containing Oaks, Maples and Hickories, as well as lowland swamp forests of Swamp Pin Oak, Swamp White Oak, and Bur Oak. Portions of the tallgrass prairie were also undergoing shrub succession, particularly by Dogwood, Sumac and Willows (ERCA, 1992). In flora and fauna surveys undertaken several years later, 200 plant species were recorded in the park, including 59 species that were considered rare either in Essex County or Ontario (Lum et al., 1995).

WSP completed recent ELC vegetation community mapping in the Oakwood Natural Area on June 8, 2022. Results indicate the presence of 15 natural ELC Vegetation Types in eight Community Series (Table 3-30, Figure 3-23). These vegetation types represent those described in Lee et al., 1998. In addition, there are two anthropogenic Community Series present, Green Lands and Transportation and Utilities, better representing those described in

Lee, 2008. Based on these results, Oakwood Natural Area can be described as having high vegetation community diversity.

The ELC vegetation communities are comprised of 62.26% (17.65 ha) terrestrial habitat and 32.66% (9.26 ha) wetland habitat (Table 3-31). The very small remaining portion of the natural area is a shallow pond (0.35% or 0.1 ha).

Terrestrial habitat includes two herbaceous plant community series (Open Tallgrass Prairie and Cultural Meadow) and four woody plant community series including Tallgrass Woodland, Deciduous Forest and Cultural Thicket and Woodland. Wetland habitat includes three Deciduous Swamp communities. Based on the area associated with these communities, Oakwood Natural Area can be characterized primarily as cultural (36.08% or 10.23 ha) and swamp habitats (32.66% or 9.26 ha), followed by forest (22.33% or 6.33 ha) and tallgrass ecosystems (3.84% and 1.09 ha).

A description of the dominant ELC vegetation communities in the Oakwood Natural Area is provided below. The ELC vegetation community mapping results are shown in Figure 3-23.

Table 3-30: Oakwood Natural Area ELC Vegetation Community Diversity

Community Class	Community Series	ELC Code	Ecosite / Vegetation Type	G-rank	S-rank	Area (ha)	%
Tallgrass Prairie, Savannah and Woodland	Open Tallgrass Prairie	TPO1-1	Dry Tallgrass Prairie Type	G3	S1	0.42	1.50
		TPO2-1	Fresh – Moist Tallgrass Prairie Type	G2	S1	0.12	0.43
	Tallgrass Woodland	TPW2-1	Fresh – Moist Black Oak – White Oak Tallgrass Woodland Type	G2	S1	0.54	1.90
Forest	Deciduous Forest	FOD8	Fresh – Moist Poplar – Sassafras Deciduous Forest Ecosite			0.46	1.62
		FOD8-1	Fresh – Moist Poplar Deciduous Forest Type			0.52	1.85
		FOD9	Fresh – Moist Oak – Maple – Hickory – Deciduous Forest Ecosite			5.34	18.85
Cultural	Cultural Meadow	CUM1-1	Dry – Moist Old Field Meadow Type			1.53	5.40
		CUM1-1/ TPO1-1	Dry – Moist Old Field Meadow Type/ Dry Tallgrass Prairie Type			3.74	13.18
		CUM1-1/ TPO2-1	Dry – Moist Old Field Meadow Type/ Fresh – Moist Tallgrass Prairie Type			2.60	9.17
	Cultural Thicket	CUT1	Mineral Cultural Thicket Ecosite			0.52	1.85
	Cultural Woodland	CUW1	Mineral Cultural Woodland Ecosite			1.84	6.49
Swamp	Deciduous Swamp	SWD1-3	Pin Oak Mineral Deciduous Swamp Type	G2	S2S3	8.76	30.89

Community Class	Community Series	ELC Code	Ecosite / Vegetation Type	G-rank	S-rank	Area (ha)	%
Swamp	Deciduous Swamp	SWD3-2	Silver Maple Mineral Deciduous Swamp Type			0.33	1.15
		SWD3-3	Swamp Maple Mineral Deciduous Swamp Type			0.18	0.64
Shallow Water	Mixed Shallow Aquatic	SAM1	Mixed Shallow Aquatic Ecosite			0.10	0.36
Constructed*	Green Lands	CGL-2	Parkland			0.61	2.17
	Transportation and Utilities	CVI-1	Transportation			0.73	2.57
Total						28.35	100

Notes: * Anthropogenic ELC community series as described in Lee, 2008.

Table 3-31: Oakwood Natural Area ELC Community Class Statistics

ELC Community Class	Area (ha)	Proportion (%)
Terrestrial	17.65	62.26
Tallgrass Prairie, Savannah and Woodland	1.09	3.84
Forest	6.33	22.33
Cultural	10.23	36.08
Wetland	9.26	32.66
Swamp	9.26	32.66
Aquatic	0.1	0.35
Shallow Water	0.10	0.35
Anthropogenic	1.34	4.73
Constructed	1.34	4.73
Total	28.35	100



LEGEND

NATURAL HERITAGE REVIEW BOUNDARY

ELC VEGETATION COMMUNITY BOUNDARY

ELC CODE	ELC DESCRIPTION
CGL-2	PARKLAND
CUM1-1	DRY - MOIST OLD FIELD MEADOW TYPE
CUT1	MINERAL CULTURAL THICKET ECOSITE
CUW1	MINERAL CULTURAL WOODLAND ECOSITE
CVI-1	TRANSPORTATION
FOD8	FRESH - MOIST POPLAR - SASSAFRAS DECIDUOUS FOREST ECOSITE
FOD8-1	FRESH - MOIST POPLAR DECIDUOUS FOREST TYPE
FOD9	FRESH - MOIST OAK - MAPLE - HICKORY DECIDUOUS FOREST ECOSITE
SAM1	MIXED SHALLOW AQUATIC ECOSITE
SWD1-3	PIN OAK MINERAL DECIDUOUS SWAMP TYPE
SWD3-2	SILVER MAPLE MINERAL DECIDUOUS SWAMP TYPE
SWD3-3	SWAMP MAPLE MINERAL DECIDUOUS SWAMP TYPE
TPO1-1	DRY TALLGRASS PRAIRIE TYPE
TPO2-1	FRESH - MOIST TALLGRASS PRAIRIE TYPE
TPW2-1	FRESH - MOIST OAK TALLGRASS WOODLAND TYPE

REFERENCE(S)

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PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N.

CLIENT



THE CITY OF

WINDSOR

ONTARIO, CANADA

PROJECT

PROPOSED NATIONAL URBAN PARK IN WINDSOR
OJIBWAY PRAIRIE COMPLEX
NATURAL HERITAGE REVIEW REPORT

TITLE

2022 ELC VEGETATION COMMUNITY MAPPING
OAKWOOD NATURAL AREA

CONSULTANT



YYYY-MM-DD	2024-03-05
DESIGNED	SS
PREPARED	HB
REVIEWED	
APPROVED	

PROJECT NO.

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3.2.8.1 ELC Community Descriptions

The largest vegetation community by area in the Oakwood Natural Area is Pin Oak Mineral Deciduous Swamp (SWD1-3). The canopy is dominated by Swamp Pin Oak, followed by Swamp White Oak, Silver Maple and Shagbark Hickory (>25 m in height; >60% cover). The subcanopy contains Black Cherry, Swamp White Oak, Shagbark Hickory and Trembling Aspen (10-25 m in height; 25-60% cover). The understory is comprised of abundant American Hazelnut and Black Cherry with the occasional American Witch-hazel, Grey Dogwood and Rough-leaved Dogwood (2-10 m in height; 25-60% cover). Native species also dominate the groundcover layer, including May-apple, Sensitive Fern, Spotted Geranium, Large False Solomon's Seal and White Rattlesnakeroot (0.5-1.0 m in height; >60% cover).



Photo 3-36: Pin Oak Mineral Deciduous Swamp (SWD1-3)

This swamp community is mature based on the size and composition of the trees. Many of the large (>50 cm DBH) tree species including Oaks, Hickories and Maples are located in this community. The high diversity of Oak species and the abundance of Shagbark Hickory trees was also noted. Vernal pools, snags, fallen logs and potential hibernacula are common throughout.

Soil analysis characteristics indicate this community has a mineral soil substrate of wet sandy loam. The depth of the organic layer is 1 cm and there were no mottles or gleys observed. The depth to bedrock is >120 cm.

A smaller swamp community by area is present in the southern part of the Natural Area, Silver Maple Mineral Deciduous Swamp (SWD3-2). The canopy is dominated by abundant Silver Maple with occasional Swamp White Oak, Eastern Cottonwood, Swamp Pin Oak and Shagbark Hickory (>25 m in height; >60% cover). The subcanopy is primarily Silver Maple (10-25 m in height; 10-25% cover). The understory is comprised of abundant Ash (*Fraxinus* sp.) and shrubs such as Eastern Buttonbush, American Hazelnut, Silky Dogwood, Multiflora Rose and Honeysuckle (1-2 m in height; 10-25% cover). Native species comprise the groundcover layer, including May-apple, Spotted Jewelweed, Virginia Creeper, Raspberry/Blackberry/Dewberry species (*Rubus* sp.) and Sedges (0.2-0.5 m in height; >10-25% cover).



Photo 3-37: Silver Maple Mineral Deciduous Forest (SWD3-2)

This swamp community is mature based on the size and composition of the trees. Vernal pools, snags, fallen logs and potential hibernacula are present. Soil analysis characteristics indicate this community has a mineral soil substrate of wet sandy loam.



Photo 3-38: Fresh – Moist Oak – Maple – Hickory Deciduous Forest (FOD9)

Oakwood Natural Area also contains area of deciduous forest, the largest being Fresh – Moist Oak – Maple – Hickory Deciduous Forest Ecosite (FOD9). The canopy contains several co-dominant species including Black Oak, Freeman's Maple, Northern Red Oak, and Black Cherry with lesser amount of White Oak, Swamp White Oak, Swamp Pin Oak, Silver Maple, Pignut Hickory, and Bitternut Hickory (>25 m in height; >60% cover). The subcanopy is comprised of abundant Black Cherry and Freeman's Maple, and smaller Hickories, Oaks and Sassafras (10-25 m in height; 25-60% cover).

Black Cherry dominates the understory with the occasional American Hazelnut and Freeman's Maple. Shrubs such as Grey Dogwood, American Witch-hazel, Multiflora Rose, and

European Buckthorn are also present but uncommon (1-2 m in height; 10-25% cover). The groundcover layer contains native grasses, forbs, and vines, including May-apple, Large False Soloman's Seal, White Rattlesnakeroot, Pennsylvania Sedge, and Virginia Creeper (0.2-0.5 m in height; 10-25% cover).

This forest community is mature based on the size and composition of the trees. However, there are scattered, large Oaks (>50 cm DBH) that may also be indicative of old growth. The high diversity of Oak and Hickory species is also a notable feature of this community. Snags, fallen logs and potential hibernacula are common throughout. Soil analysis characteristics indicate this community has a mineral soil substrate with an overall texture of sandy loam.

The largest cultural community by area is the Dry – Moist Old Field Meadow (CUM1-1). A portion of this community is on City-owned land adjacent to the recreation centre parking lot. In this area, the groundcover layer is a mix of native and exotic species. The dominant species are cool-season grasses such as Orchard Grass and Meadow Ryegrass. Smooth Scouring Rush is also abundant. Noted native species include Goldenrods, Common Milkweed, Spreading Dogbane and Old-field Cinquefoil (0.5-1 m in height; >60% cover). Dogwoods,



Photo 3-39: Dry – Moist Old Field Meadow (CUM1-1)

Eastern Cottonwood and Red Ash are found in the understory (1-2 m in height; 0-10% cover). There is also the occasional Eastern Cottonwood and Red Ash reaching 2-10 m in height in the sub-canopy layer (0-10% cover).

The Dry – Moist Old Field Meadows in Oakwood Natural Area are noted to be of relatively high quality with a good representation of native plant species, including SAR. The soil analysis characteristics indicate this community has a mineral soil substrate of fresh sandy loam. The depth of the organic layer is 1 cm and there were no mottles or gleys observed. The depth to bedrock is >120 cm.

A large portion of the Dry – Moist Old Field Meadows are found on private property and have characteristics of remnant/restored Dry and Fresh – Moist Tallgrass Prairie communities. One property owner, MTO, has actively managed the meadow for over 10 years. The plant community composition on their property is also a mix of native and exotic species. Similar to the meadow on City property, a few cool-season grasses tend to dominate the groundcover layer; however, there is a much greater diversity of native forbs present. Other cultural meadows on private property are noted to be undergoing succession to cultural thicket, especially where Autumn Olive has invaded.

Lastly, Oakwood Natural Area contains three tallgrass ecosystems, Fresh – Moist Tallgrass Prairie (TPO2-1), Dry Tallgrass Prairie (TPO1-1) and Fresh – Moist Black Oak – White Oak Tallgrass Woodland (TPW2-1).

Small remnant patches of Fresh – Moist Tallgrass Prairie are found on private property. Observations from outside the property boundary note the presence of tallgrass prairie indicators such as Yellow Indiangrass, Virginia Mountain-mint and Butterfly Milkweed. There is however woody species encroachment in the area. Eastern Cottonwood is becoming abundant in the subcanopy layer and a mix of native and exotic shrubs and small trees are present in the understory. These include Autumn Olive, Dogwoods, Ash, and Hawthorn species.

The Dry Tallgrass Prairie is a restored plant community found along the western side of the Natural Area. It provides an ecological connection between Oakwood Natural Area, the T5 Ecopassage, and Spring Garden Natural Area. Native grasses and forbs were hydroseeded after construction of the Parkway was completed. Warm-season grasses are dominant, including Old Switch Panicgrass, Yellow Indiangrass, Little Bluestem and Big Bluestem. There are also abundant native forbs such as Common Milkweed, Wild Bergamot, Foxglove Beardtongue, Virginia Mountain-mint, and Tall Boneset.



Photo 3-40: Parkway Multi-use Trail with Restored Dry Tallgrass Prairie (TPO1-1)

The Fresh – Moist Black Oak – White Oak Tallgrass Woodland is located in the northern portion of the Natural Area. The dominant species in the canopy is Black Oak, followed by Swamp White Oak, Swamp Pin Oak and White Oak (>25 m in height; 25-60% cover). There is no subcanopy and the understory has only sparse cover of one species, Black Raspberry (2-10 m in height; 0-10% cover). The groundcover layer is dense with cool-season grasses, Marsh Blue Violet, and young Autumn Olive (0.5-1 m in height; >60% cover).



Photo 3-41: Fresh – Moist Black Oak – White Oak Tallgrass Woodland (TPW2-1)

This small remnant tallgrass woodland is considered old growth based primarily on the size and composition of the tree species.

The soil analysis characteristics indicate this community has a mineral soil substrate of fresh loamy sand. The depth of the organic layer is 1 cm and the depth to mottles is 50 cm. The depth to bedrock is >120 cm.

3.2.8.2 Rare Vegetation Communities

The following rare communities were identified and mapped in the Oakwood Natural Area. The rarity ranks for the vegetation community are in accordance with those identified by the NHIC. Oakwood Natural Area contains four vegetation communities that are ranked both provincially and globally significant.

- Dry Tallgrass Prairie Type (TPO1-1; G3/S1)
- Fresh – Moist Tallgrass Prairie Type (TPO2-1; G2/S1)
- Fresh – Moist Black Oak – White Oak Tallgrass Woodland Type (TPW2-1; G2/S1)
- Pin Oak Mineral Deciduous Swamp Type (SWD1-3; G2/S2S3)

Together, these vegetation communities comprise 9.85 ha or 34.74% of the Oakwood Natural Area (Table 3-30).

In addition to the rare plant communities above, Oakwood Natural Area also contains land identified as the provincially significant Oakwood Park Wetland (Figure 3-24). This PSW is primarily within the Deciduous Swamps and Poplar Deciduous Forest vegetation communities.



LEGEND

NATURAL HERITAGE REVIEW BOUNDARY

EVALUATED PROVINCIAL WETLAND (LAND INFORMATION ONTARIO, 2021)

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REFERENCE(S)

COUNTY OF ESSEX, IMAGERY SERVICE: COUNTY 2022 AIRPHOTO, COUNTY 2021 AIRPHOTOMAP DATA © OPENSTREETMAP CONTRIBUTORS, MICROSOFT, FACEBOOK, INC. AND ITS AFFILIATES, ESRI COMMUNITY MAPS CONTRIBUTORS, MAP LAYER BY ESRI. LAND INFORMATION ONTARIO. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE – ONTARIO, CANADA. PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N.

CLIENT

PROJECT

PROPOSED NATIONAL URBAN PARK IN WINDSOR
OJIBWAY PRAIRIE COMPLEX
NATURAL HERITAGE REVIEW REPORT

TITLE

DESKTOP NATURAL HERITAGE REVIEW
OAKWOOD NATURAL AREA

CONSULTANT	YYYY-MM-DD	2024-03-05
DESIGNED	SS	
PREPARED	HB	
REVIEWED		
APPROVED		

PROJECT NO. IM22104012

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FIGURE 3-24

3.2.8.3 Significant Trees

The composition of large, old trees (>50 cm DBH) in the Oakwood Natural Area is presented in Table 3-32 and Figure 3-25. There were 12 species with individuals measuring over 50 cm DBH. The most frequently sampled species was Swamp Pin Oak (29%), followed by Swamp White Oak (25%) and White Oak (11%). Other large Oaks including Bur Oak, Black Oak and Northern Red Oak were also present, comprising an additional 14% of the trees sampled. In total, Oak species comprised the greatest proportion (79%) of large-diameter trees. Other species including Eastern Cottonwood (9%), Maples (6%) and Hickories (4%) were present in smaller numbers (Table 3-32, Figure 3-25).

Large Oaks ranged in age from approximately 61 to 147 yrs old (Swamp Pin Oak). The average age of large-diameter tree species is presented in Table 3-32 and Figure 3-26. The oldest tree species on average was Black Oak (averaging 126 yrs old), followed by Swamp White Oak (117 yrs old), Bur Oak (117 yrs old) and White Oak (110 yrs old). A single Bitternut Hickory and Pignut Hickory were estimated to be 198 and 236 yrs old, respectively. The youngest, large tree species sampled was Eastern Cottonwood, averaging 63 yrs old. Like the Eastern Cottonwood sampled in other natural areas, these large individuals would be considered “old” for the species.

The large trees sampled are present within the Pin Oak Mineral Deciduous Swamp and Oak – Maple – Hickory Deciduous Forest communities.

Table 3-32: Composition of Large Tree Species (>50 cm DBH) Present in Oakwood Natural Area

Common Name	Scientific Name	S-Rank	No. Recorded	Tree Size (cm DBH)			Estimate of Tree Age (yr)		
				Min.	Max.	Average DBH (±SE)	Min.	Max.	Average Age (±SE)
Freeman's Maple	<i>Acer x freemanii</i>	SNA	1		63.5			88	
Silver Maple	<i>Acer saccharinum</i>	S5	2	84.7	96.5	90.6 (±5.9)	100	114	107 (±7)
Bitternut Hickory	<i>Carya cordiformis</i>	S5	1		72.0			198	
Pignut Hickory	<i>Carya glabra</i>	S3	1		80.0			236	
Common Hackberry	<i>Celtis occidentalis</i>	S4	1		52.7			83	
Eastern Cottonwood	<i>Populus deltoides</i>	S5	4	65.0	113.3	80.2 (±11.1)	51	89	63 (±9)
White Oak	<i>Quercus alba</i>	S5	5	51.0	62.0	56.4 (±2.2)	100	122	111 (±4)
Swamp White Oak	<i>Quercus bicolor</i>	S4	12	51.0	69.4	59.5 (±2.0)	100	137	117 (±4)
Bur Oak	<i>Quercus macrocarpa</i>	S5	3	54.0	67.0	59.3 (±3.9)	106	132	117 (±8)
Swamp Pin Oak	<i>Quercus palustris</i>	S4	14	51.8	124.5	76.2 (±4.8)	61	147	90 (±6)
Northern Red Oak	<i>Quercus rubra</i>	S5	2	57.5	82.0	69.8 (±12.3)	91	129	110 (±19)
Black Oak	<i>Quercus velutina</i>	S4	2	74.5	86.0	80.3 (±5.8)	117	135	126 (±9)
Total Number of Large Trees Sampled			48						

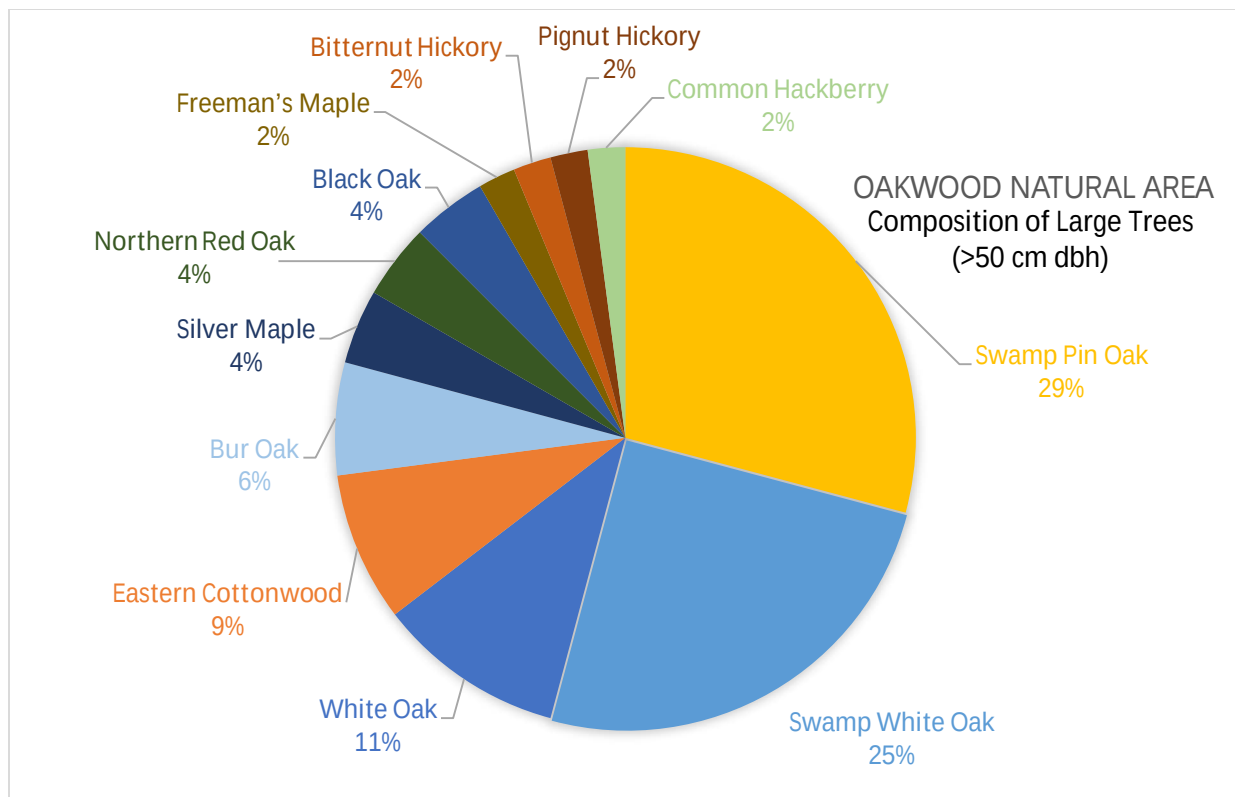


Figure 3-25: Composition of Large Tree Species (>50 cm DBH) in Oakwood Natural Area

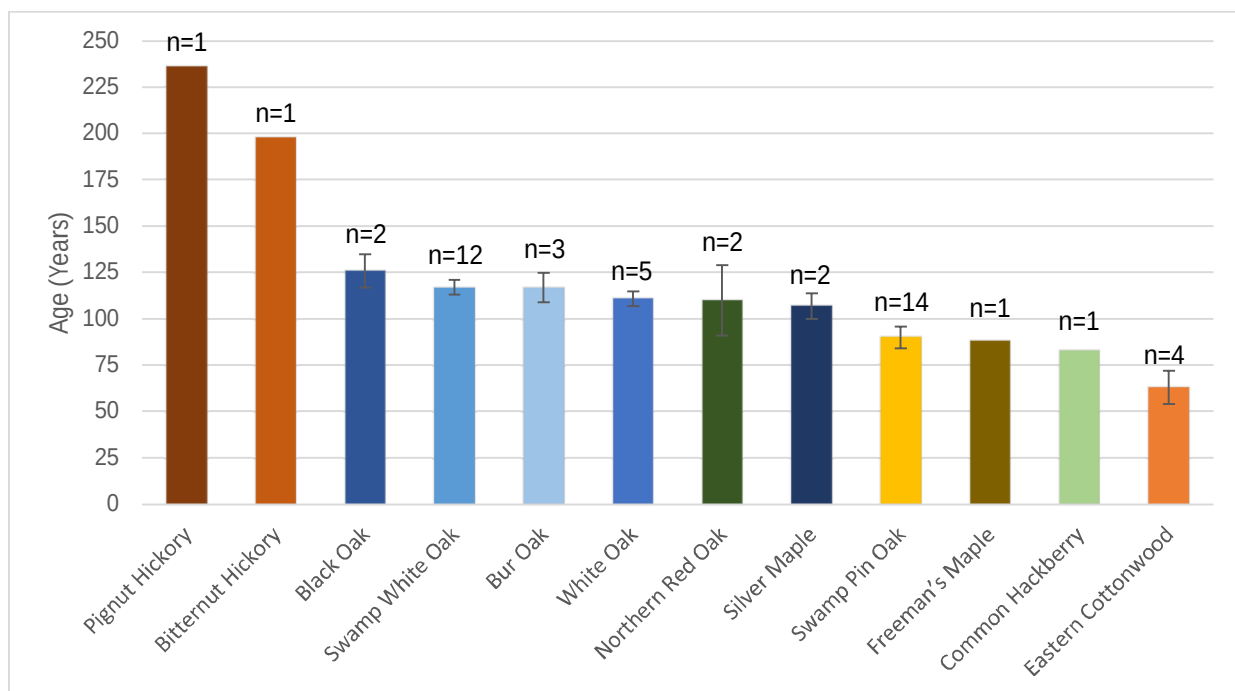


Figure 3-26: Average Age of Large Tree Species in Oakwood Natural Area

3.2.8.4 Plant SAR and Provincially Rare Species

In field surveys conducted by ERCA in 1992 and Lum et al. in 1995, there were a total of 37 provincially rare plant species recorded in the Oakwood Natural Area, including seven listed as SAR. In recent verified and research grade sightings posted to iNaturalist three additional rare species, including one SAR, were observed.

In surveys conducted by WSP and in communications with City staff, two additional rare species were noted to occur. Altogether, a total of 42 provincially rare plant species, including eight listed as SAR, were recorded in the Oakwood Natural Area (Table 3-33).

In addition to the species observed in the Oakwood Natural Area, a review of secondary source information from the NHIC and rare species lists compiled for the entire Ojibway Prairie Complex indicate that additional provincially rare species (including SAR) may occur within and/or around the Natural Area where suitable habitat exists (Appendix B).

Table 3-33: Plant SAR and Provincially Rare Species Observed in Oakwood Natural Area

(Removed to protect sensitive information)

3.2.8.5 Invasive Exotic Species

Many of the non-native species found in Oakwood Natural Area during natural heritage assessments can be further characterized as invasive or aggressive species (Table 3-34; Urban Forest Associates Inc., 2002). These species, if left unchecked, have the potential to become dominant in the landscape and threaten native biodiversity. Below is a list of Category 1 to 3 invasive exotic species that are recommended for population monitoring in the site. These species are most likely to require targeted management to keep populations under control or to eradicate them entirely.

Table 3-34: Select Invasive Exotic Species in Oakwood Natural Area

Common Name	Scientific Name	Category No. ¹
Manitoba Maple	<i>Acer negundo</i>	1
Garlic Mustard	<i>Alliaria petiolata</i>	1
Orchard Grass	<i>Dactylis glomerata</i>	3
Autumn Olive	<i>Elaeagnus umbellata</i>	1
White Mulberry	<i>Morus alba</i>	1
European Reed	<i>Phragmites australis ssp. australis</i>	1
European Buckthorn	<i>Rhamnus cathartica</i>	1
Multiflora Rose	<i>Rosa multiflora</i>	1

Notes: ¹ Category 1 (aggressive invasive); Category 2 (highly invasive but niche-specific); and Category 3 (moderately invasive but can become locally dominant when the proper conditions exist).

3.2.9 SOUTH CAMERON WOODLOT AREA

The South Cameron Woodlot Area is comprised of two separate areas. The core area is approximately 100 ha and is located south of Totten Street, between Huron Church Road and Dominion Avenue, north of E.C. Row. It includes South Cameron Woodlot Park which contains trails for pedestrian access and passive recreational use. A smaller area, approximately 25 ha, is located to the east of the core area and is bound by Arcadia Street to the north, Longfellow Ave. to the west, and South Cameron Boulevard to the east (Figure 1-1).

In 1992, ERCA identified the core South Cameron Woodlot Area as a Candidate Natural Heritage Site, containing a mosaic of deciduous woodland, swamp, thicket, old fencerows, and abandoned agricultural fields. The abandoned agricultural land regenerated back into natural habitats, including tallgrass prairie, both extensive and diverse. In the eastern portion of the site, poorly drained soils contained Oak-dominated woodland and mesic-wet areas were dominated by Swamp Pin Oak swamp. The northwest section of the site consisted of a young deciduous forest while a significant portion of other areas were late-successional fields dominated by native shrub species (ERCA, 1992). By the time ERCA re-evaluated the core South Cameron Woodlot Area in 2008, the site was increasingly bound by residential development along all sides. Mature woodland in the east contained numerous large, lowland species in the ephemeral pools and the old field meadows had succeeded into mature shrub thickets (ERCA, 2008). Outside the core Woodlot Area in lands to the east, there was active disturbance occurring over much of the site.

WSP completed recent ELC vegetation community mapping in the core Woodlot Area on June 8 - 10, 2022. Follow-up evaluations were completed on the eastern property in fall 2022.

In the core Woodlot Area, results indicate the presence of seven natural ELC Vegetation Types in four Community Series (Table 3-35, Figure 3-27). These vegetation types represent those described in Lee et al., 1998. In addition, there are two anthropogenic Community Series present, Green Lands and Residential, better representing those described in Lee, 2008. Based on these results, the core South Cameron Woodlot Area can be described as having a diverse vegetation community composition.

The ELC vegetation communities are comprised of 61.39% (60.90 ha) terrestrial habitat and 33.99% (33.72 ha) wetland habitat. The remaining portion of the core Woodlot Area is residential and parkland (Table 3-36).

Terrestrial habitat includes herbaceous Cultural Meadow and two woody plant community series (Cultural Thicket and Cultural Woodland). Wetland habitat includes Deciduous Swamp. Based on the areas associated with these communities, the core South Cameron Woodlot Area can be characterized primarily as swamp (33.99% or 33.72 ha) and cultural woodland habitat (33.85% or 33.58 ha), followed by cultural meadow (20.68% or 20.68 ha) and cultural thicket (6.69% or 6.64 ha).

In the smaller eastern portion of the South Cameron Woodlot Area, the Terrestrial habitat also includes Cultural Meadow and Thicket, as well as successional Deciduous Forest. Wetland habitat includes Deciduous Swamp. Based on the areas associated with these

communities, the eastern South Cameron Woodlot site can be characterized primarily as cultural meadow (39.41% or 9.91 ha), followed by swamp (29.34% or 7.38 ha), successional forest (22.79% or 5.73 ha), and cultural thicket (2.76% or 0.69 ha).

The ELC vegetation community mapping results are shown in Figure 3-27. A detailed description of the ELC vegetation communities, focused in the core South Cameron Woodlot Area, is provided in Section 3.2.9.1 below.

Table 3-35: South Cameron Woodlot Area ELC Vegetation Community Diversity

Community Class	Community Series	ELC Code	Ecosite / Vegetation Type	G-rank	S-rank	Area (ha)	%
Core South Cameron Woodlot Area							
Cultural	Cultural Meadow	CUM1	Mineral Cultural Meadow Ecosite			7.57	7.63
		CUM1-1	Dry – Moist Old Field Meadow Type			13.11	13.21
	Cultural Thicket	CUT1	Mineral Cultural Thicket Ecosite			6.39	6.44
		CUT1-4	Gray Dogwood Cultural Thicket Type			0.25	0.25
	Cultural Woodland	CUW1	Mineral Cultural Woodland Ecosite			33.58	33.85
Swamp	Deciduous Swamp	SWD1-1	Swamp White Oak Mineral Deciduous Swamp Type	G1G2	S2S3	5.96	6.01
		SWD1-3	Pin Oak Mineral Deciduous Swamp Type	G2	S2S3	27.76	27.98
Constructed*	Green Lands	CGL-2	Parkland			0.31	0.31
	Residential	CVR				4.27	4.31
Total						99.21	100
Eastern South Cameron Woodlot Area							
Cultural	Cultural Meadow	CUM1	Mineral Cultural Meadow Ecosite			0.85	3.40
		CUM1-1	Dry – Moist Old Field Meadow Type			7.82	31.08
		CUM1-1/ CUT1	Dry – Moist Old Field Meadow Type/ Mineral Cultural Thicket Ecosite			1.24	4.94
	Cultural Thicket	CUT1	Mineral Cultural Thicket Ecosite			0.69	2.76
Forest	Deciduous Forest	FOD3-1	Dry - Fresh Poplar Deciduous Forest Type			2.81	11.18
		FOD8-1	Fresh – Moist Poplar Deciduous Forest Type			2.92	11.61

Community Class	Community Series	ELC Code	Ecosite / Vegetation Type	G-rank	S-rank	Area (ha)	%
Swamp	Deciduous Swamp	SWD1-3/ SWD1-1	Pin Oak Mineral Deciduous Swamp Type/ Swamp White Oak Mineral Deciduous Swamp Type	G2/ G1G2Q	S2S3/ S2S3	7.38	29.34
Constructed*	Commercial and Institutional	CVC				1.06	4.20
	Residential	CVR				0.37	1.48
Total						25.15	100

Notes: * Indicates an anthropogenic community series as described in Lee, 2008.

Table 3-36: South Cameron Woodlot Area ELC Community Class Statistics

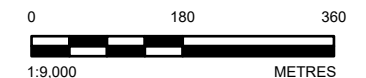
ELC Community Class	Area (ha)	Proportion (%)
Core South Cameron Woodlot Area		
Terrestrial	60.90	61.39
Cultural Meadow	20.68	20.84
Cultural Thicket	6.64	6.69
Cultural Woodland	33.58	33.85
Wetland	33.72	33.99
Swamp	33.72	33.99
Anthropogenic	4.58	4.62
Constructed	4.58	4.62
Total	99.21	100
Eastern South Cameron Woodlot Area		
Terrestrial	16.33	64.96
Cultural Meadow	9.91	39.41
Cultural Thicket	0.69	2.76
Forest	5.73	22.79
Wetland	7.38	29.34
Swamp	7.38	29.34
Anthropogenic	1.43	5.68
Constructed	1.43	5.68
Total	25.15	100



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-  NATURAL HERITAGE REVIEW BOUNDARY
 ELC VEGETATION COMMUNITY BOUNDARY
 MUNICIPAL DRAIN

ELC CODE	ELC DESCRIPTION
CGL-2	PARKLAND
CUM1	MINERAL CULTURAL MEADOW ECOSITE
CUM1-1	DRY - MOIST OLD FIELD MEADOW TYPE
CUT1	MINERAL CULTURAL THICKET ECOSITE
CUT1-4	GRAY DOGWOOD CULTURAL THICKET TYPE
CUW1	MINERAL CULTURAL WOODLAND ECOSITE
CVC	COMMERCIAL AND INSTITUTIONAL
CVR	RESIDENTIAL
FOD3-1	DRY - FRESH POPLAR DECIDUOUS FOREST TYPE
FOD8-1	FRESH - MOIST POPLAR DECIDUOUS FOREST TYPE
SWD1-1	SWAMP WHITE OAK MINERAL DECIDUOUS SWAMP TYPE
SWD1-3	PIN OAK MINERAL DECIDUOUS SWAMP TYPE



REFERENCE(S)

COUNTY OF ESSEX, IMAGERY SERVICE: COUNTY 2022 AIRPHOTO, COUNTY 2021
AIRPHOTOMAP DATA © OPENSTREETMAP CONTRIBUTORS, MICROSOFT, FACEBOOK, INC. AND
ITS AFFILIATES, ESRI COMMUNITY MAPS CONTRIBUTORS, MAP LAYER BY ESRI.
CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE –
ONTARIO, CANADA.
PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N.

CLIENT



PROJECT
PROPOSED NATIONAL URBAN PARK IN WINDSOR
OJIBWAY PRAIRIE COMPLEX
NATURAL HERITAGE REVIEW REPORT

TITLE

2022 ELC VEGETATION COMMUNITY MAPPING SOUTH CAMERON WOODLOT AREA

CONSULTANT

YYYY-MM-DD 2024-02-22

DESIGNED

PREPARED

REVIEWED

PROJECT NO. _____

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FIGURE

FIGURE
3-27

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B 5mm

3.2.9.1 ELC Community Descriptions

There are two types of deciduous swamp communities in the core South Cameron Woodlot Area: Pin Oak Mineral Deciduous Swamp (SWD1-3) and Swamp White Oak Mineral Deciduous Swamp (SWD1-1).

The largest swamp community by area is Pin Oak Mineral Deciduous Swamp. The canopy is dominated by Swamp Pin Oak followed by Swamp White Oak, Eastern Cottonwood and Silver Maple (10-25 m or >25 m in height depending on location; >60% cover). The subcanopy is comprised primarily of the same species present

in the canopy, with Shagbark Hickory, American Elm and Basswood also present (10-25 m in height; 25-60% cover). The understory contains Grey Dogwood, European Buckthorn and Hawthorn shrubs, as well as small Swamp Pin Oak, Red Ash and American Elm (2-10 m in height; 25-60% or >60% cover depending on location). Fowl Mannagrass, Virginia Creeper and Sedges are abundant in the groundcover layer (0.2-0.5 m in height; 25-60% or >60% cover depending on location).

Portions of the swamp community are estimated to be young, mid-aged and mature. The mid-aged and mature areas contain the greatest number of large (>50 cm DBH) Swamp Pin Oak, Swamp White Oak, Bur Oak, Eastern Cottonwood and Silver Maple trees. Vernal pools, snags, fallen logs and potential hibernacula are common throughout the swamp community.

The soil analysis characteristics indicate this community has a mineral soil substrate of wet silty clay. The depth of the organic layer ranged from 1 to 10 cm and the depth to mottles is 20 cm. Depth to bedrock is >120 cm.



Photo 3-42: Mature Pin Oak Mineral Deciduous Swamp (SWD1-3)

The Swamp White Oak Mineral Deciduous Swamp community is comprised of Swamp White Oak, Swamp Pin Oak, Eastern Cottonwood, Shagbark Hickory and Bitternut Hickory in the canopy (>25 m in height; >60% cover). The subcanopy contains the same dominant species as the canopy, only smaller in height (10-25 m) and with less cover (10-25% or 25-60% cover depending on location). Common Prickly-ash and European Buckthorn are abundant in the understory, followed by Grey Dogwood, Rough-leaved Dogwood, small Hickories and Red Ash (2-10 m in height; 10-25% or 25-60% cover depending on location). The groundcover is dominated by Virginia Creeper and Poison Ivy (0.2-0.5 m in height; 25-60% cover).



Photo 3-43: Swamp White Oak Mineral Deciduous Swamp (SWD1-1)

This community is estimated to be mid-aged to mature based on tree size and composition. Large (>50 cm DBH) Swamp White Oak trees are present. Vernal pools, snags, fallen logs and potential hibernacula are also common throughout the swamp community. Soil analysis was not undertaken in these areas because much of the community is on private property or inaccessible.

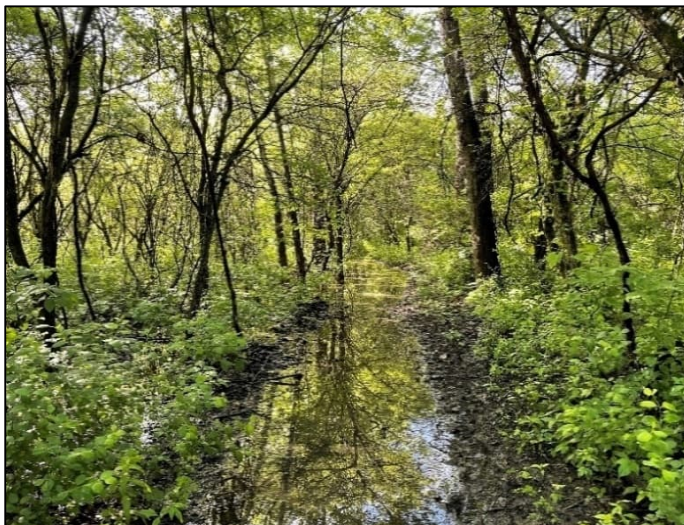


Photo 3-44: Mineral Cultural Woodland (CUW1)

Cultural community types comprise the remainder of the South Cameron Woodlot Area. The Mineral Cultural Woodland (CUW1) is the most widespread cultural community and is dominated by a canopy of Eastern Cottonwood, Silver Maple, Swamp Pin Oak and American Elm (>25 m in height; 25-60% cover). The subcanopy contains Eastern Cottonwood, Swamp Pin Oak, Swamp White Oak and Black Walnut (10-25 m in height; 10-25% cover). The understory is characterized by the dense cover of shrubs species that include Hawthorns (*Crataegus sp.*), European

Buckthorn, Grey Dogwood and Rough-leaved Dogwood (2-10 m in height; >60% cover). Swamp Agrimony, Virginia Creeper and Poison Ivy are abundant in the groundcover layer (0.5-1 m in height; >60% cover).

This woodland community is relatively young but transitioning to mid-aged. Prior to succeeding to a cultural woodland, the area was reported to be a cultural thicket dominated by Dogwood and Hawthorn species (ERCA, 2008). Vernal pools, fallen logs, snags and potential hibernacula are all present in this community. Soil analysis was not undertaken in this community because it is primarily on private property or inaccessible.

There are two cultural thicket communities within this natural area: Mineral Cultural Thicket (CUT1) and Grey Dogwood Cultural Thicket (CUT1-4). In general, these thickets were noted to be of low quality, with exception of small open areas that contain species having prairie and meadow affinities. Although vernal pools are present in one thicket, there are minimal wildlife benefits compared to other habitats in the site. Soil analysis was not undertaken in these communities because they are on private property. However, one sample taken from the City's road allotment adjacent to CUT1-4 indicates the soil to be a moist sandy clay. There are no mottles or gleys and the depth to bedrock is >120 cm.



Photo 3-45: Mineral Cultural Thicket (CUT1)

The Mineral Cultural Meadow (CUM1) and Dry – Moist Old Field Meadow (CUM1-1) communities represent the most recently disturbed cultural ecosites. These areas appear to be periodically mowed or cultivated. They are primarily located at the periphery of the natural area. Species observations were made from the City road allotments. The CUM1 meadows are routinely mowed. The CUM1-1 are fields dominated by cool-season grasses and Red Clover, but there are some native species such as Goldenrods and Rushes present.



Photo 3-46: Dry – Moist Old Field Meadow (CUM1-1)

Tallgrass prairie indicators are known to occur at edges. Soil analysis was not undertaken in these communities because they are on private property or inaccessible.

3.2.9.2 Rare Vegetation Communities

The following rare communities were identified and mapped in South Cameron Woodlot Area. Rarity ranks for the vegetation community are in accordance with those identified by the NHIC. Both communities are identified as globally and provincially rare.

- Swamp White Oak Mineral Deciduous Swamp (SWD1-1; G1G2/S2S3)
- Pin Oak Mineral Deciduous Swamp (SWD1-3; G2/S2S3)

Together, these vegetation communities comprise 33.72 ha or 33.99% of the core Woodlot Area and 7.38 ha or 29.35% of the eastern site (Table 3-36).

The core South Cameron Woodlot Area also contains the provincially significant South Cameron Wetland Complex and lands regulated by ERCA (Figure 3-28). This PSW is delineated primarily within Pin Oak Mineral Deciduous Swamp and portions of Swamp White Oak Mineral Deciduous Swamp and Mineral Cultural Woodland communities.

3.2.9.3 Significant Trees

The composition of large, old trees (>50 cm DBH) in the core South Cameron Woodlot Area is presented in Table 3-37 and Figure 3-29. There were 11 species with individuals measuring over 50 cm DBH. The most frequently sampled species were Swamp Pin Oak (32%) and Eastern Cottonwood (32%), followed by Swamp White Oak (21%). Other large Oaks included Bur Oak, White Oak and Northern Red Oak which comprised an additional 5% of the trees sampled. In total, Oak species comprised the greatest proportion (58%) of large-diameter trees, followed by Eastern Cottonwood (32%). Other species including Maples (4%) and American Elm (4%) were present in smaller numbers (Table 3-37, Figure 3-29).

Large Oaks ranged in age from approximately 59 (Swamp Pin Oak) to 232 yrs old (White Oak). The average age of large-diameter tree species is presented in Table 3-37 and Figure 3-30. The oldest tree species on average was White Oak (averaging 209 yrs old), followed by American Elm (139 yrs old), Swamp White Oak (130 yrs old), and Bur Oak (117 yrs old). The youngest, large tree species sampled was Swamp Pin Oak averaging 84 yrs old. Swamp Pin Oak is one of the faster growing Oak species with a typically mortality of 100 yrs., indicating that these large individuals would still be considered “old” for the species.

The large trees sampled are present mostly within the Swamp White Oak Deciduous Swamp and Pin Oak Deciduous Swamp.

Table 3-37: Composition of Large Tree Species (>50 cm DBH) Present in the Core South Cameron Woodlot Area

Common Name	Scientific Name	S-Rank	No. Recorded	Tree Size (cm DBH)			Estimate of Tree Age (yr)		
				Min.	Max.	Average DBH (±SE)	Min.	Max.	Average Age (±SE)
Red Maple	<i>Acer rubrum</i>	S5	1		65.0			115	
Silver Maple	<i>Acer saccharinum</i>	S5	10	50.0	100.0	72.5 (±5.1)	59	118	86 (±6.0)
Bitternut Hickory	<i>Carya cordiformis</i>	S5	1		50.0			138	
Eastern Cottonwood	<i>Populus deltoides</i>	S5	76	50.0	144.0	69.1 (±1.9)	39	113	54 (±2)
White Oak	<i>Quercus alba</i>	S5	3	100.0	118.0	106.0 (±6.0)	197	232	209 (±12)
Swamp White Oak	<i>Quercus bicolor</i>	S4	51	50.0	114.0	65.8 (±2.0)	98	224	130 (±4)
Bur Oak	<i>Quercus macrocarpa</i>	S5	10	50.0	68.0	58.4 (±1.6)	98	134	117 (±3)
Swamp Pin Oak	<i>Quercus palustris</i>	S4	77	50.0	109.0	71.2 (±1.7)	59	129	84 (±2)
Northern Red Oak	<i>Quercus rubra</i>	S5	1		105.0			124	
Basswood	<i>Tilia americana</i>	S5	1		87.0			103	
American Elm	<i>Ulmus americana</i>	S5	9	53.2	124.4	70.5 (±7.2)	105	245	139 (±14)
Total Number of Large Trees Sampled			240						

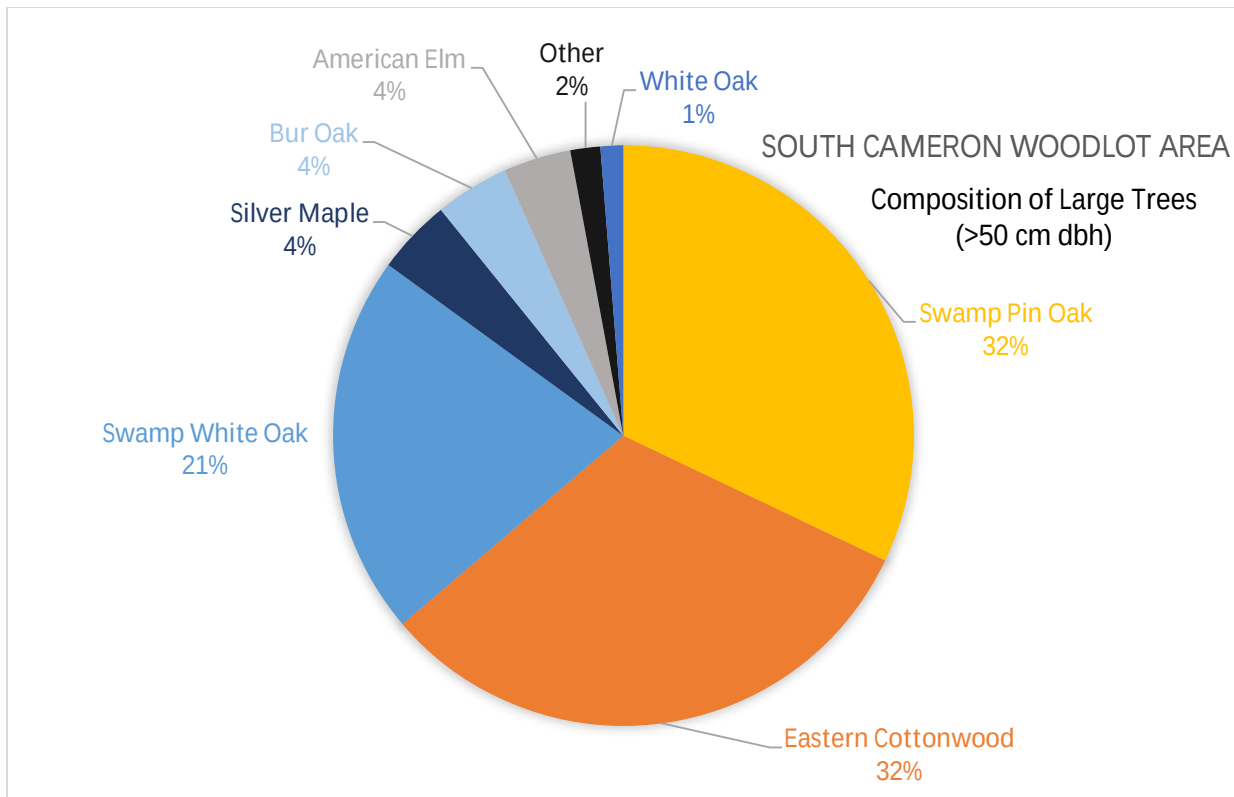


Figure 3-29: Composition of Large Tree Species (>50 cm DBH) in the core South Cameron Woodlot Area

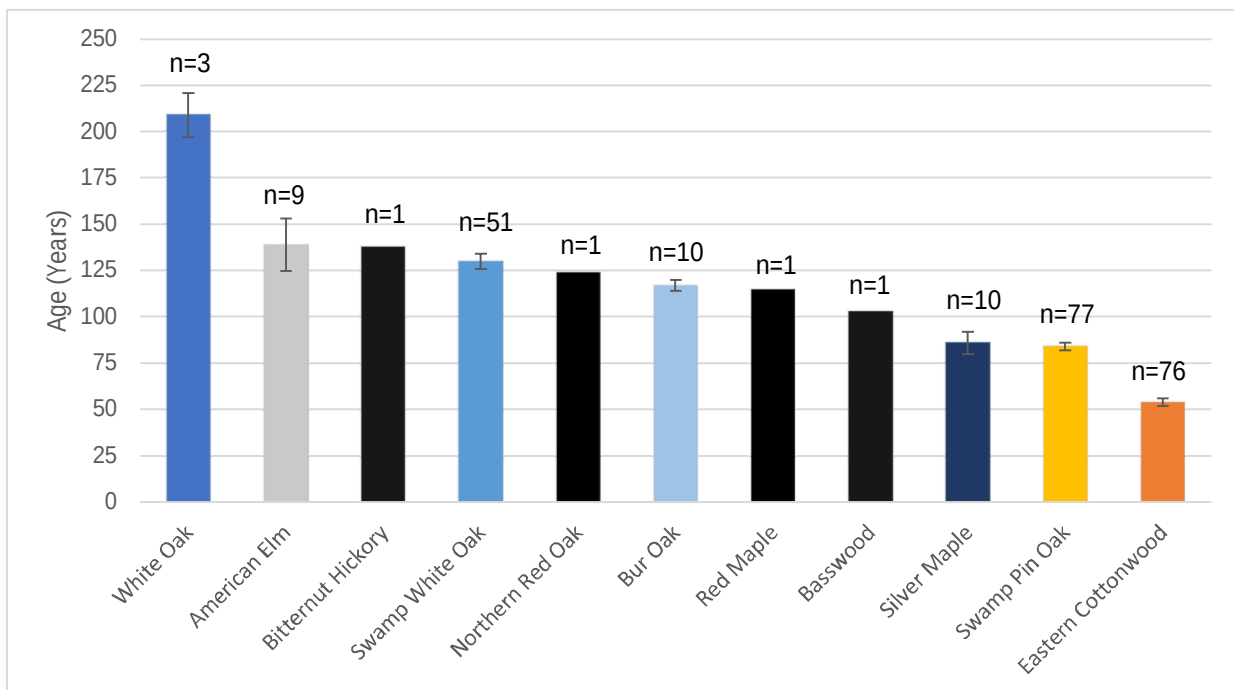


Figure 3-30: Average Age of Large Tree Species in the core South Cameron Woodlot Area

3.2.9.4 Plant SAR and Provincially Rare Species

In field surveys conducted by ERCA in 1992 and 2008, there were a total of 24 provincially rare plant species recorded in the core South Cameron Woodlot Area, including five listed as SAR.

Surveys conducted by WSP in summer 2022 and a review of the verified and research grade sightings posted to iNaturalist confirmed the presence of species already known to occur on the site.

In addition to the observed species in the core South Cameron Woodlot Area, a review of secondary source information from the NHIC indicates that many additional provincially rare species (including SAR) may occur within and/or around the Woodlot Area where suitable habitat exists (Appendix B).

Table 3-38: Plant SAR and Provincially Rare Species Observed in the Core South Cameron Woodlot Area

(Removed to protect sensitive information)

3.2.9.5 Invasive Exotic Species

Many of the non-native species found in the South Cameron Woodlot Area during natural heritage assessments can be further characterized as invasive or aggressive species (Table 3-39; Urban Forest Associates Inc., 2002). These species, if left unchecked, have the potential to become dominant in the landscape and threaten native biodiversity. Below is a list of Category 1 to 3 invasive exotic species that are recommended for population monitoring in the site. These species are most likely to require targeted management to keep populations under control or to eradicate them entirely.

Table 3-39: Select Invasive Exotic Species in South Cameron Woodlot Area

Common Name	Scientific Name	Category No. ¹
Garlic Mustard	<i>Alliaria petiolata</i>	1
Canada Thistle	<i>Cirsium arvense</i>	1
Orchard Grass	<i>Dactylis glomerata</i>	3
White Mulberry	<i>Morus alba</i>	1
European Reed	<i>Phragmites australis ssp. australis</i>	1
European Buckthorn	<i>Rhamnus cathartica</i>	1
Multiflora Rose	<i>Rosa multiflora</i>	1
Black Locust	<i>Robinia pseudo-acacia</i>	2

Notes: ¹ Category 1 (aggressive invasive); Category 2 (highly invasive but niche-specific); and Category 3 (moderately invasive but can become locally dominant when the proper conditions exist).

3.2.10 MALDEN PARK

Malden Park is approximately 66 ha and is bound by Malden Road to the east, Matchett Road to the west, and E.C. Row Expressway to the south (Figure 1-1). Malden Park was acquired by the City in 1956 and was a City-owned and operated landfill for the disposal of domestic and industrial waste until 1973. Between 1973 and 1993, the landfill was used for the disposal of earth or rock fill until it was formally closed. With assistance from the National Infrastructure Program in 1994, the City's Department of Parks and Recreation assumed responsibility for converting the former landfill into a public park. In 1996, the City began developing the public amenities including the Malden Visitor Centre (opened in 1998), tobogganing hill, sports fields, and creation of an extensive trail system. Other open areas that were previously disturbed were naturalized.

Toward the end of landfill operations in 1992, ERCA included Malden Park in their Candidate Natural Heritage Site biological inventory (ERCA, 1992). They noted that the remnant wooded areas on the site possessed good natural understory. The woodlands were characterized as an upland Black Oak community and a lowland wet-mesic community. The undisturbed grassy meadow that was present contained prairie indicator species. The other open areas subjected to landfill operations were very disturbed.

WSP completed recent ELC vegetation community mapping on June 6 - 8, 2022. Results indicate the presence of seven natural or naturalized ELC Vegetation Types in five Community Series (Table 3-40, Figure 3-31). These vegetation types are representative of those described in Lee et al., 1998. In addition, there were two anthropogenic Community Series present, Green Lands and Commercial and Institutional, better representing the vegetation types described in Lee, 2008. Based on these results, Malden Park can be described as having a diverse vegetation community composition.

The ELC vegetation communities are comprised of 73.86% (48.66 ha) terrestrial habitat, 3.28% (2.16 ha) wetland habitat, 2.22% (1.46 ha) aquatic habitat and 20.64% (13.6 ha) of parkland and institutional (i.e., City) uses (Table 3-41).

Terrestrial habitats include herbaceous Cultural Meadow and two woody plant community series (Cultural Woodland and Deciduous Forest). Wetlands include Deciduous Swamp and aquatic ecosystems support two Submerged Shallow Aquatic communities. Based on the area associated with these communities, Malden Park can be characterized primarily as cultural woodland habitat (42.69% or 28.12 ha), followed by cultural meadow (22.71% or 14.96 ha), forest (8.47% or 5.58 ha), swamp (3.28% or 2.16 ha) and aquatic (2.22% or 1.46ha).

A description of the ELC vegetation communities in Malden Park is provided below. The ELC vegetation community mapping results are shown in Figure 3-31.

Table 3-40: Malden Park ELC Vegetation Community Diversity

Community Class	Community Series	ELC Code	Ecosite / Vegetation Type	G-rank	S-rank	Area (ha)	%
Forest	Deciduous Forest	FOD1-3	Dry – Fresh Black Oak Deciduous Forest Type	G4?	S3	3.47	5.27
		FOD9-2	Fresh – Moist Oak – Maple Deciduous Forest Type			2.11	3.20
Cultural	Cultural Meadow	CUM1-1	Dry – Moist Old Field Meadow Type			14.96	22.71
	Cultural Woodland	CUW1	Mineral Cultural Woodland Ecosite			28.12	42.69
Swamp	Deciduous Swamp	SWD1-3	Pin Oak Mineral Deciduous Swamp Type	G2	S2S3	2.16	3.28
Shallow Water	Submerged Shallow Aquatic	SAS1	Submerged Shallow Aquatic Ecosite			1.01	1.53
		SAS1-4	Water Milfoil Submerged Shallow Aquatic Type			0.46	0.69
Constructed*	Green Lands	CGL-2	Parkland			9.67	14.68
	Commercial and Institutional	CVC				3.93	5.96
Total						65.88	100

Notes: * Indicates an anthropogenic community series as described in Lee, 2008.

Table 3-41: Malden Park ELC Community Class Statistics

ELC Community Class	Area (ha)	Proportion (%)
Terrestrial	48.66	73.86
Forest	5.58	8.47
Cultural	43.08	65.39
Wetland	2.16	3.28
Swamp	2.16	3.28
Aquatic	1.46	2.22
Shallow Water	1.46	2.22
Anthropogenic	13.60	20.64
Constructed	13.60	20.64
Total	65.88	100

3.2.10.1 ELC Community Descriptions

The Mineral Cultural Woodland (CUW1) in Malden Park is dominated by a canopy of both native and exotic tree species, including Manitoba Maple, Black Walnut, Tree-of-heaven, Honey Locust, and Eastern Cottonwood (10-25 m in height; 25-60% cover). Other species such as Siberian Elm, White Mulberry, Common Hackberry and Silver Maple are scattered throughout. Coniferous species present include Eastern White Pine, Blue Spruce and Norway Spruce.

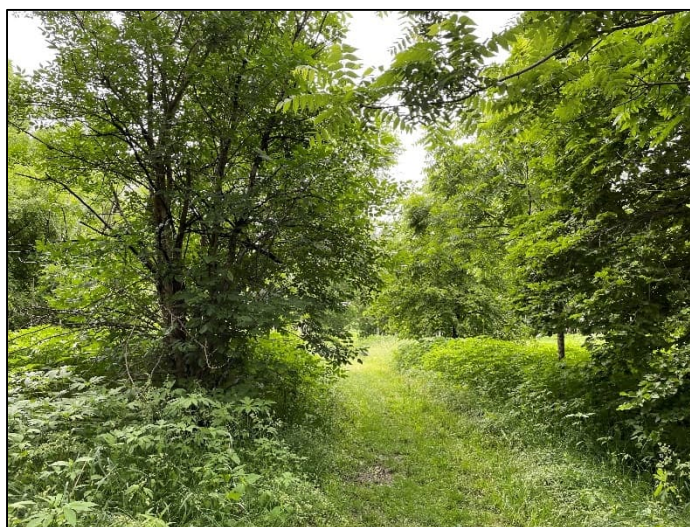


Photo 3-47: Mineral Cultural Woodland (CUW1)

The sub-canopy is comprised primarily of the same species present in the canopy, except smaller in the height (2-10 m in height; 10-25% or 25-60% depending on location).

The understory contains shrub species such as Gray Dogwood, Nannyberry, Canada Yew and Eastern Ninebark, as well as regenerating canopy species (1-2 m in height; 10-25% or 25-60% depending on location). The groundcover is less than a meter in height and is dominated by cool-season grasses (Orchard Grass and Kentucky Bluegrass) and non-native forbs (>60% cover).

The Cultural Woodland community is estimated to be young to mid-aged, with some areas appearing to be naturalized earlier than others. Wildlife habitat is present in the form of fallen logs and potential hibernacula. The soil analysis characteristics indicate this

community has a mineral soil substrate of fresh silt and moist clay loam. The depth of the organic layer is 1 cm and the depth to mottles is 40 cm. Depth to bedrock is >120 cm.

The Dry – Fresh Old Field Meadow (CUM1-1) is dominated by cool-season grasses including Orchard Grass and Kentucky Bluegrass, as well as non-native forbs such as Common Teasel, Common Ragweed, European Reed, and Canada Thistle (0.5-1 m in height; >60% cover). There are however some common native species present such as Goldenrods and Common Milkweed.



Photo 3-48: Dry – Fresh Old Field Meadow (CUM1-1)

Scattered shrubs in the understory include Sumac, Grey Dogwood and Tartarian Honeysuckle (1-2 m in height; 0-10% cover). There is also the occasional Manitoba Maple and White Mulberry reaching 2-10 m in height (0-10% cover) in the sub-canopy layer. There are infrequent large trees (10-25 m; 10-25% cover) such as Honey Locust, Eastern White Pine and Silver Maple present in the canopy of this community that appear to have been planted as part of the Park's naturalization processes.

The soil analysis characteristics indicate this community has a mineral soil substrate of moderate to moist clay loam and fresh loamy sand. The depth of the organic layer is 1 cm and there were no mottles or gleys. Depth to bedrock is >120 cm.

There are two forest ecosites present in Malden Park: Dry – Fresh Black Oak Deciduous Forest Type (FOD1-3) and Fresh – Moist Oak – Maple Deciduous Forest Type (FOD9-2). Both of these communities are intact remnants from before landfill activities were undertaken at the site (i.e. mid-1950's).



Photo 3-49: Dry – Fresh Black Oak Deciduous Forest (FOD1-3)

The Dry – Fresh Black Oak Deciduous Forest is a provincially rare plant community. The canopy height is over 25 m and tree cover is greater than 60%. The dominant species is Black Oak. Silver Maple, Freeman's Maple and White Oak are

also abundant, with lesser amounts of Black Cherry, Swamp Pin Oak and Pignut Hickory. The sub-canopy is dominated by Pignut Hickory and Freemans' Maple and to a lesser extent, Black Cherry and White Mulberry (10-25 m in height; 10-25% or 25-60% cover depending on location). Shrubs including American Witch-hazel and Gray Dogwood are common in the understory (1-2 m in height; 25-60% or >60% cover depending on location).

Virginia Creeper, Spotted Geranium, Large False Solomon's Seal and Royal and Bracken Fern comprise the groundcover layer (0.2-1 m in height; >60% cover).

This forest community is estimated to be mid-aged to mature (depending on location), of high quality and relatively undisturbed compared to other areas of the park. Many trees, especially Black Oak and Swamp Pin Oak, measured over 50 cm DBH. There is wildlife habitat present in the form of fallen logs and potential hibernacula. The soil analysis characteristics indicate this community has a mineral soil substrate of moderately fresh/rapid sandy loam and fresh loamy sand. The depth of the organic layer is 1 cm and there were no mottles or gleys. Depth to bedrock is >120 cm.

The Fresh – Moist Oak Maple Deciduous Forest is dominated by a canopy of Swamp Pin Oak, Silver Maple and Eastern Cottonwood, with lesser amounts of Freeman's Maple, Swamp White Oak and Black Oak (>25 m in height; >60% cover). The sub-canopy contains abundant Silver Maple and the occasional Manitoba Maple, Swamp White Oak, Black Cherry, American Elm and Black Gum (10-25 m in height; 25-60% cover). The understory contains native shrubs such as Gray Dogwood and American Hazelnut (2-10 m in height; 10-25% cover) and the groundcover is dominated by Spotted Jewelweed, Virginia Creeper, Canada Anemone and Royal and Bracken Fern (0.2-0.5 m in height; 25-60% cover).



Photo 3-50: Fresh – Moist Oak Maple Deciduous Forest (FOD9-2)

This forest community is estimated to be mid-aged based on the size of the trees. There is wildlife habitat present in the form of vernal pools, fallen logs and hibernacula. It surrounds both the drier Black Oak-dominated forest community and the Swamp Pin Oak swamp to the southeast.

Soil analysis characteristics indicate a mineral soil substrate of very moist loamy sand. The depth of the organic layer is 1 cm and the depth to mottles is 50 cm. Depth to bedrock is >120 cm. It is important to note that this community type, along with the Pin Oak Mineral Deciduous Swamp, are the only community types with native substrate that was disturbed, removed or replaced as a result of landfill activity.

The wetland community in Malden Park consists of a Pin Oak Mineral Deciduous Swamp (SWD1-3). This community has a canopy dominated by Eastern Cottonwood, Swamp Pin Oak and Silver Maple with lesser amounts of Swamp White Oak and American Elm (>25 cm in height; 25-60% cover). The sub-canopy contains smaller Silver Maple, Manitoba Maple and Ash species (10-25 m in height; 25-60% cover). The understory and groundcover layer are sparsely vegetated (both 0-10% cover) with species such as European Reed, White Mulberry, Spotted Jewelweed and Virginia Creeper.



Photo 3-51: Pin Oak Mineral Deciduous Swamp (SWD1-3)

This swamp community is estimated to be mid-aged to mature based on the size of the trees. There is potential wildlife habitat present in the form of fallen logs and hibernacula. Soil analysis was not conducted at the time because the site was covered in standing water.

Lastly, Malden Park contains two submerged aquatic communities, both of which are man-made ponds. The Submerged Shallow Aquatic (SAS1) pond contains emergent European Reed around the perimeter and Willows in the upland area. The Water Milfoil Submerged Shallow Aquatic (SAS1-4) pond is characterized by the presence of submerged Eurasian Water-milfoil and emergent European Reed around the pond edges. Eastern Buttonbush and willow species are found in the upland areas.



Photo 3-52: Water Milfoil Submerged Shallow Aquatic (SAS1-4)

3.2.10.2 *Rare Vegetation Communities*

The following rare communities were identified and mapped in Malden Park. Rarity ranks for the vegetation communities are in accordance with those identified by the NHIC. Malden Park contains two vegetation communities that are ranked provincially significant and one that is globally significant.

- Dry – Fresh Black Oak Deciduous Forest Type (FOD1-3; G4?/S3)
- Pin Oak Mineral Deciduous Swamp Type (SWD1-3; G2/S2S3)

These vegetation communities comprise 5.63 ha or 8.55% of Malden Park (Table 3-41).

In addition to the rare plant communities above, Malden Park also contains land with other environmentally significant designations, including a portion of the provincial Ojibway Prairie Wetland Complex (PSW) and lands regulated by ERCA (Figure 3-32). The PSW is delineated within the Pin Oak Deciduous Swamp vegetation community.



- LEGEND**
- NATURAL HERITAGE REVIEW BOUNDARY
 - REGULATION AREA (ESSEX REGION CONSERVATION AUTHORITY)
 - EVALUATED PROVINCIAL WETLAND (LAND INFORMATION ONTARIO, 2021)
 - OVERHEAD UTILITY LINE/UTILITY CORRIDOR



REFERENCE(S)
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CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE – ONTARIO, CANADA.
PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N.

CLIENT
THE CITY OF WINDSOR
ONTARIO, CANADA

PROJECT
PROPOSED NATIONAL URBAN PARK IN WINDSOR
OJIBWAY PRAIRIE COMPLEX
NATURAL HERITAGE REVIEW REPORT

TITLE
DESKTOP NATURAL HERITAGE REVIEW
MALDEN PARK

CONSULTANT	YYYY-MM-DD	2024-02-22
DESIGNED	SS	
PREPARED	HB	
REVIEWED		
APPROVED		



3.2.10.3 Significant Trees

The composition of large, old trees (>50 cm DBH) in Malden Park is presented in Table 3-42 and Figure 3-33. There were seven species with individuals measuring over 50 cm DBH. The most frequently sampled species were Black Oak (55%) and Swamp Pin Oak (30%). Other large Oaks included White Oak and Swamp White Oak which comprised an additional 6% of the trees sampled. In total, Oak species comprised the greatest proportion (91%) of large-diameter trees. Other species included Maples (7%) and Eastern Cottonwood (2%) smaller numbers (Table 3-42, Figure 3-33).

Large Oaks ranged in age from approximately 60 (Swamp Pin Oak) to 152 yrs old (White Oak). The average age of large-diameter tree species is presented in Table 3-42 and Figure 3-34. The oldest tree species on average was White Oak (averaging 142 yrs old), followed by Black Oak (99 yrs old) and Swamp Pin Oak (79 yrs old). The youngest, large tree species sampled was Manitoba Maple, averaging approximately 48 yrs old.

The large oak trees are present within the remnant Black Oak Deciduous Forest and Swamp Pin Oak Deciduous Swamp.

Table 3-42: Composition of Large Tree Species (>50 cm DBH) Present in Malden Park

Common Name	Scientific Name	S-Rank	No. Recorded	Tree Size (cm DBH)			Estimate of Tree Age (yr)		
				Min.	Max.	Average DBH (±SE)	Min.	Max.	Average Age (±SE)
Manitoba Maple	<i>Acer negundo</i>	S5	3	57.0	64.0	61.0 (±2.1)	45	50	48 (±2)
Silver Maple	<i>Acer saccharinum</i>	S5	1		98.0			116	
Eastern Cottonwood	<i>Populus deltoides</i>	S5	1		83.0			65	
White Oak	<i>Quercus alba</i>	S5	2	64.6	80.0	72.3 (±7.7)	127	157	142 (±3)
Swamp White Oak	<i>Quercus bicolor</i>	S4	1		55.0			108	
Swamp Pin Oak	<i>Quercus palustris</i>	S4	17	51.0	113.0	67.1 (±4.3)	60	133	79 (±5)
Black Oak	<i>Quercus velutina</i>	S4	31	50.5	90.0	63.0 (±1.9)	80	142	99 (±3)
Total Number of Large Trees Sampled			56						

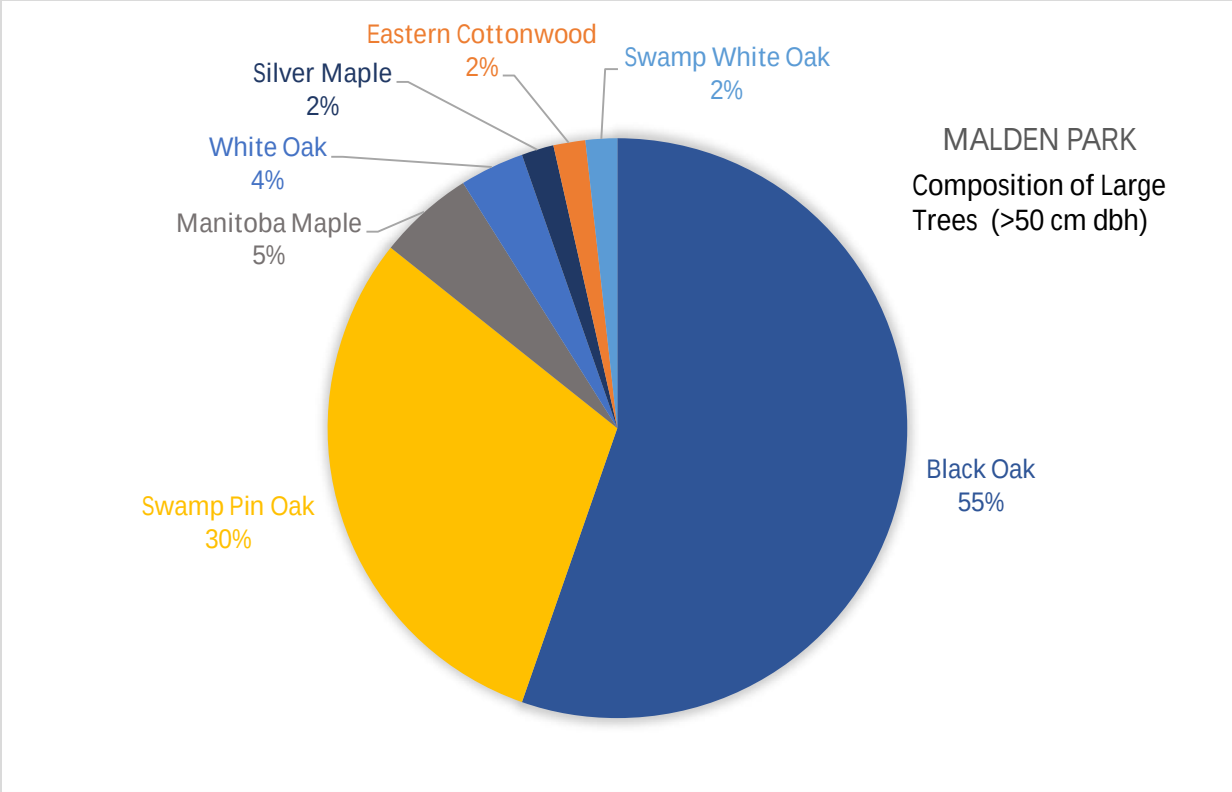


Figure 3-33: Composition of Large Tree Species (>50 cm DBH) in Malden Park

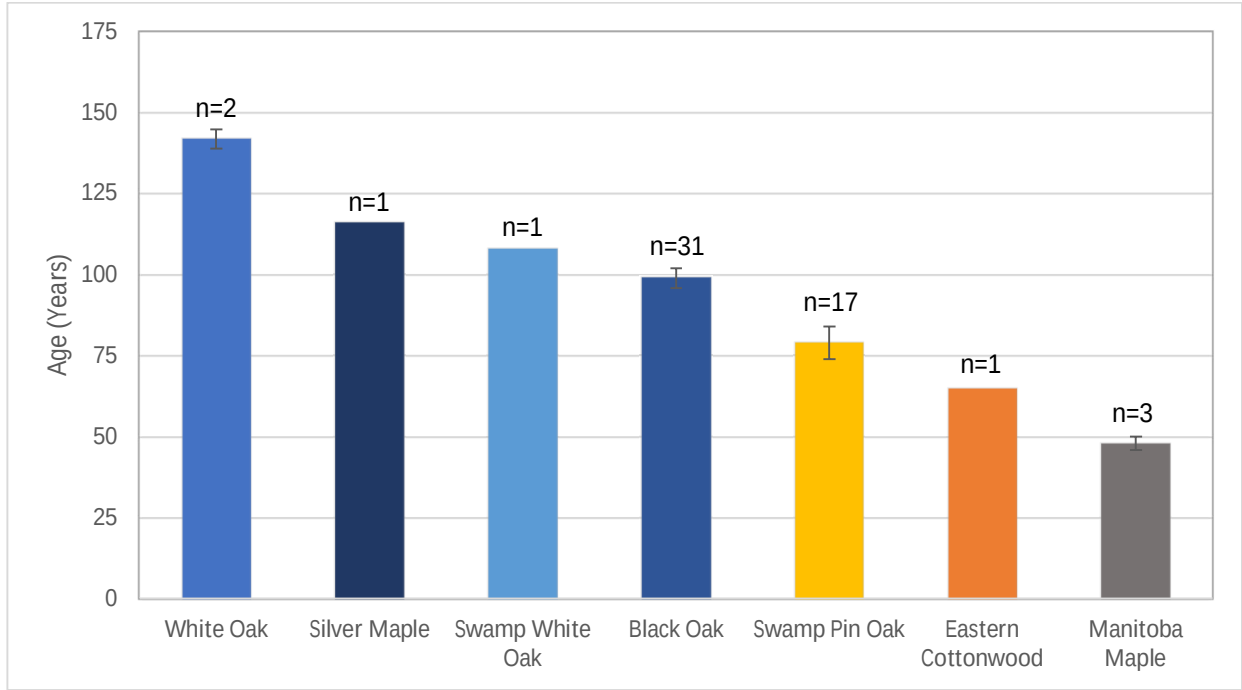


Figure 3-34: Average Age of Large Tree Species in Malden Park

3.2.10.4 Plant SAR and Provincially Rare Species

In field surveys conducted by ERCA in 1992, a total of six provincially rare plant species were recorded in Malden Park, including two listed as SAR. In surveys conducted by WSP in 2022, three additional rare species were observed.

Altogether, a total of nine provincially rare plant species, including two SAR, are known to occur in Malden Park (Table 3-43).

In addition to the observed species in Malden Park, a review of secondary source information from the NHIC indicates that many additional provincially rare species (including SAR) may occur within and/or around Malden Park where suitable habitat exists (Appendix B).

Table 3-43: Plant SAR and Provincially Rare Species Observed in Malden Park

(Removed to protect sensitive information)

3.2.10.5 Invasive Exotic Species

Many of the non-native species found in Malden Park during natural heritage assessments can be further characterized as invasive or aggressive species (Table 3-44; Urban Forest Associates Inc., 2002). These species, if left unchecked, have the potential to become dominant in the landscape and threaten native biodiversity. Below is a list of Category 1 to 3 invasive exotic species that are recommended for population monitoring in the site (Table 3-44). These species are most likely to require targeted management to keep populations under control or to eradicate them entirely.

Table 3-44: Select Invasive Exotic Species in Malden Park

Common Name	Scientific Name	Category No. ¹
Norway Maple	<i>Acer platanoides</i>	2
Manitoba Maple	<i>Acer negundo</i>	1
Tree-of-heaven	<i>Ailanthus altissima</i>	2
Garlic Mustard	<i>Alliaria petiolate</i>	1
Canada Thistle	<i>Cirsium arvense</i>	1
Orchard Grass	<i>Dactylis glomerata</i>	3
Common Teasel	<i>Dipsacus fullonum</i>	3
Dames Rocket	<i>Hesperis matronalis</i>	1
Honeysuckle species	<i>Lonicera sp.</i>	1
Purple Loosestrife	<i>Lythrum salicaria</i>	1
White Mulberry	<i>Morus alba</i>	1
Eurasian Water-milfoil	<i>Myriophyllum spicatum</i>	1
European Reed	<i>Phragmites australis ssp. australis</i>	1
Wild Parsnip	<i>Pastinaca sativa</i>	3

Common Name	Scientific Name	Category No. ¹
European Buckthorn	<i>Rhamnus cathartica</i>	1
Black Locust	<i>Robinia pseudoacacia</i>	2
Siberian Elm	<i>Ulmus pumila</i>	2

Notes: ¹Category 1 (aggressive invasive); Category 2 (highly invasive but niche-specific); and Category 3 (moderately invasive but can become locally dominant when the proper conditions exist).

3.2.11 OTHER NATURAL AREAS

Two additional natural areas within the City of Windsor are being considered for inclusion into the natural heritage review: Chappus Natural Area and St. Clair College Prairie and Woods. These lands are currently privately owned and therefore, natural heritage information in this report has been compiled from secondary sources including publicly available natural heritage studies, lists and databases. A discussion of vegetation communities, plant SAR and rare plant species from these resources is provided below. Field surveys for ELC community descriptions, significant trees, plant SAR and invasive species would be helpful in providing up-to-date information for these sites.

3.2.11.1 Chappus Natural Area

The Chappus Natural Area is approximately 46 ha located north of Armada Street, east of Matchett Road, west of Malden Road, and south of E.C. Row Expressway (Figure 1-1). A majority of the individual properties that comprise the site were acquired by the MTO as part of the Parkway construction and are currently protected as habitat for SAR plants and snakes. There is no authorized public access to the site at this time.

A review of the historical aerial images back to 1948 shows a long history of agricultural disturbance and general vegetation maintenance activities (e.g. mowing and/or brushing) through much of the Chappus Natural Area until the early 2000's. By 2006, Chappus Street was constructed, and new residential development extended into the site from Matchett Road. Disturbance created from planned additional housing was evident along the newly paved extension of Chappus Street and the road base along Welland Avenue and Waterloo Avenue that run south of Chappus Street to Armada Street. Other areas of the site where vegetation maintenance had ceased were undergoing natural succession to thicket and forest communities. In 2006, the site was subject to natural heritage studies as part of the environmental approvals process for construction of the Detroit River International Crossing (URS, 2008 and MTO, 2008). The results of those studies indicated the occurrence of significant natural heritage features, including provincially rare plants and plant communities, provincially significant wetlands, significant wildlife habitat and numerous SAR occurrences.

Between 2008 and 2021, much of the Chappus Natural Area was acquired by MTO and protected from further development. Homes and other built structures within the site boundary were demolished and the paved portion of Chappus Street was removed. All previously disturbed areas were actively restored with native tallgrass prairie species, and

invasive species control and prescribed burns were conducted on an annual basis. The MTO continues to actively manage the site to maintain the rare plant communities and high-quality habitat for SAR. Floristic quality assessments and extensive SAR studies have been completed on the lands as required by the Parkway provincial ESA permits.

RARE VEGETATION COMMUNITIES

There is one rare plant community known to occur in the Chappus Natural Area based on secondary source documentation: Fresh – Moist Tallgrass Prairie Type (TPO2-1; G2/S1). However, there could be additional rare communities present given the nature of NHIC data and MNRF natural heritage mapping, including Fresh – Moist Tallgrass Savannah, Oak Mineral Deciduous Swamp, and Tallgrass Prairie Meadow Marsh.

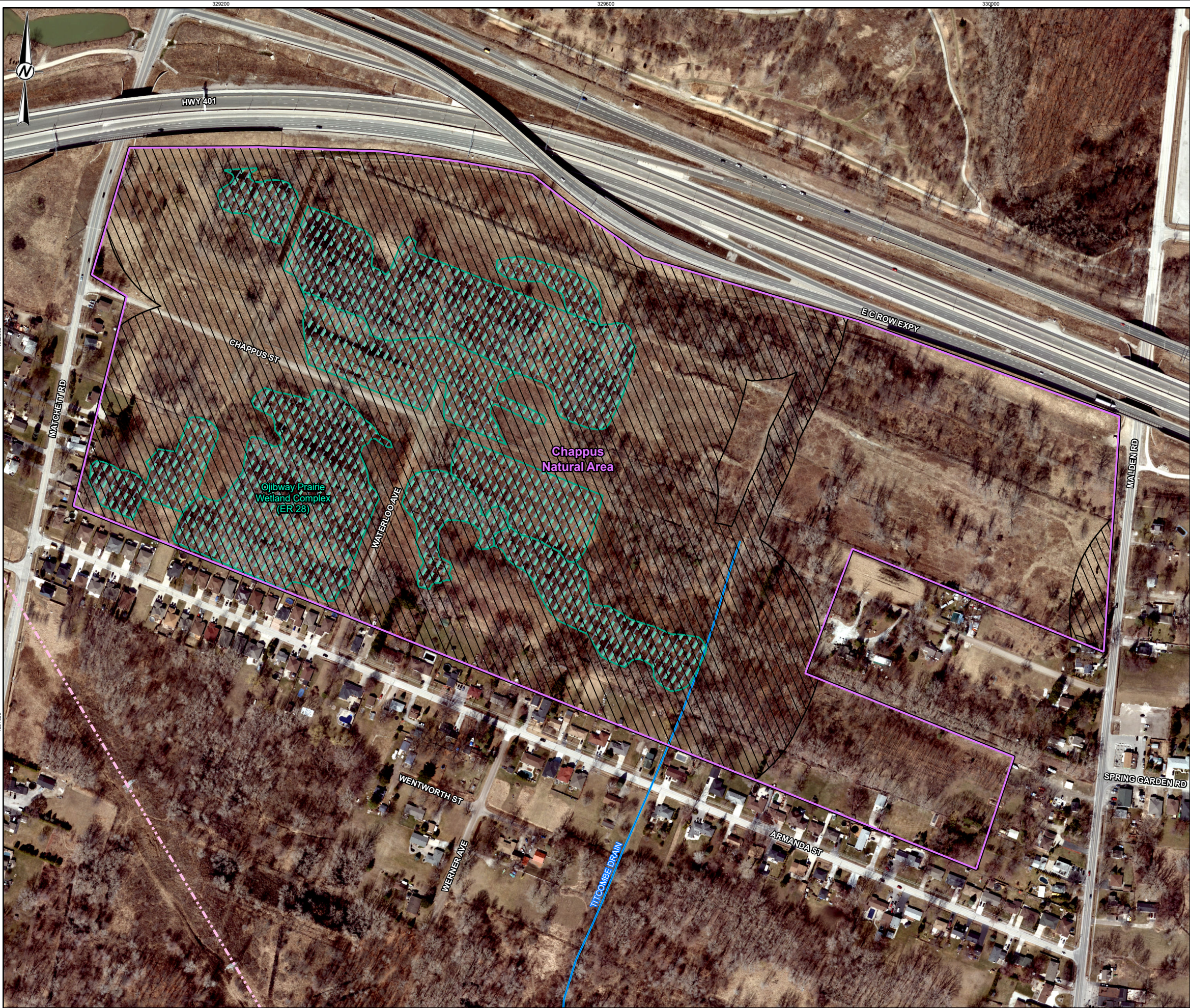
In addition to the rare plant communities above, Chappus Natural Area also contains land with other environmentally significant designations, including a portion of the provincial Ojibway Prairie Wetland Complex (PSW) and lands regulated by ERCA (Figure 3-35).

PLANT SAR AND PROVINCIALLY RARE SPECIES

Table 3-45 below includes a preliminary list of 34 rare plants and plant SAR that have been recorded in the Chappus Natural Area in publicly available information, including citizen science websites and databases.

In addition to observed species in Chappus Natural Area, a review of secondary source information from the NHIC indicates that many additional provincially rare species (including SAR) may occur within and/or around Chappus Natural Area where suitable habitat exists (Appendix B).

Table 3-45: Plant SAR and Provincially Rare Species Observed in Chappus Natural Area
(Removed to protect sensitive information)



- LEGEND**
- NATURAL HERITAGE REVIEW BOUNDARY
 - REGULATION AREA (ESSEX REGION CONSERVATION AUTHORITY)
 - EVALUATED PROVINCIAL WETLAND (LAND INFORMATION ONTARIO, 2021)
 - MUNICIPAL DRAIN
 - OVERHEAD UTILITY LINE/UTILITY CORRIDOR



REFERENCE(S)
COUNTY OF ESSEX, IMAGERY SERVICE: COUNTY 2022 AIRPHOTO, COUNTY 2021 AIRPHOTOMAP DATA © OPENSTREETMAP CONTRIBUTORS, MICROSOFT, FACEBOOK, INC. AND ITS AFFILIATES, ESRI COMMUNITY MAPS CONTRIBUTORS, MAP LAYER BY ESRI. LAND INFORMATION ONTARIO.
CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE – ONTARIO, CANADA.
PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N.

CLIENT


PROJECT
**PROPOSED NATIONAL URBAN PARK IN WINDSOR
OJIBWAY PRAIRIE COMPLEX
NATURAL HERITAGE REVIEW REPORT**

TITLE
**DESKTOP NATURAL HERITAGE REVIEW
CHAPPUS NATURAL AREA**

	CONSULTANT	YYYY-MM-DD	2024-02-22
	DESIGNED	SS	
	PREPARED	HB	
	REVIEWED		
	APPROVED		

PROJECT NO. IM22104012	CONTROL	REV. C	FIGURE 3-35
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3.2.11.2 St. Clair College Prairie and Woods

The St. Clair College Prairie and Woods is approximately 17 ha and located on the west side of St. Clair College campus. The property is surrounded by infrastructure, with the College to the east, residential development to the north, and the Parkway multi-use trail to the west/southwest. A portion of the land is owned by St. Clair College and there is currently no authorized public access to the natural area.

A portion of the St. Clair College Prairie and Woods was initially visited by P. Maycock in 1975 and described as a wet-mesic forb prairie, with a notable population of rare Prairie Rosinweed (S1) (Pratt, 1979). ERCA then performed several natural heritage evaluations of the larger area beginning in the early 1980's through the early 2000's (Oldham, 1983; ERCA, 1992 and 2008). The site is designated an Environmentally Significant Area because of its high biodiversity. ERCA reported the occurrence of tallgrass prairie indicator species in old farm fields and in small open areas in the northeast corner of the site. Otherwise, the site was composed of upland and lowland forest communities and shrub thickets (ERCA, 1995 and 2008). The upland and lowland communities were found along terrain composed of low, sandy knolls separated by broad swales associated with the shoreline of glacial Lake Rouge (ERCA 2008). The knolls supported upland forest dominated by Black Oak, White Oak, Red Maple, and Shagbark Hickory. The forested swales were dominated by Swamp Pin Oak, Swamp White Oak, Bur Oak and White Elm. The thickets were dominated by native Gray Dogwood, Willows, and Sumacs.

Based on the review of recent (2021) aerial imagery, it appears that St. Clair College Prairie and Woods is now primarily deciduous forest and swamp communities, with only small pockets of tallgrass prairie still present.

RARE VEGETATION COMMUNITIES

According to the Candidate Natural Heritage Site inventory update completed in 2008, the following rare vegetation communities were identified and mapped in St. Clair College Prairie and Woods (ERCA, 2008). The rarity ranks for the vegetation community are in accordance with those identified by the NHIC. The property contains two vegetation communities that are ranked provincially rare and one that is also ranked globally rare:

- Dry – Fresh Black Oak Deciduous Forest Type (FOD1-3; G4?/S3)
- Swamp White Oak Mineral Deciduous Swamp Type (SWD1-1; G1G2Q/S2S3)

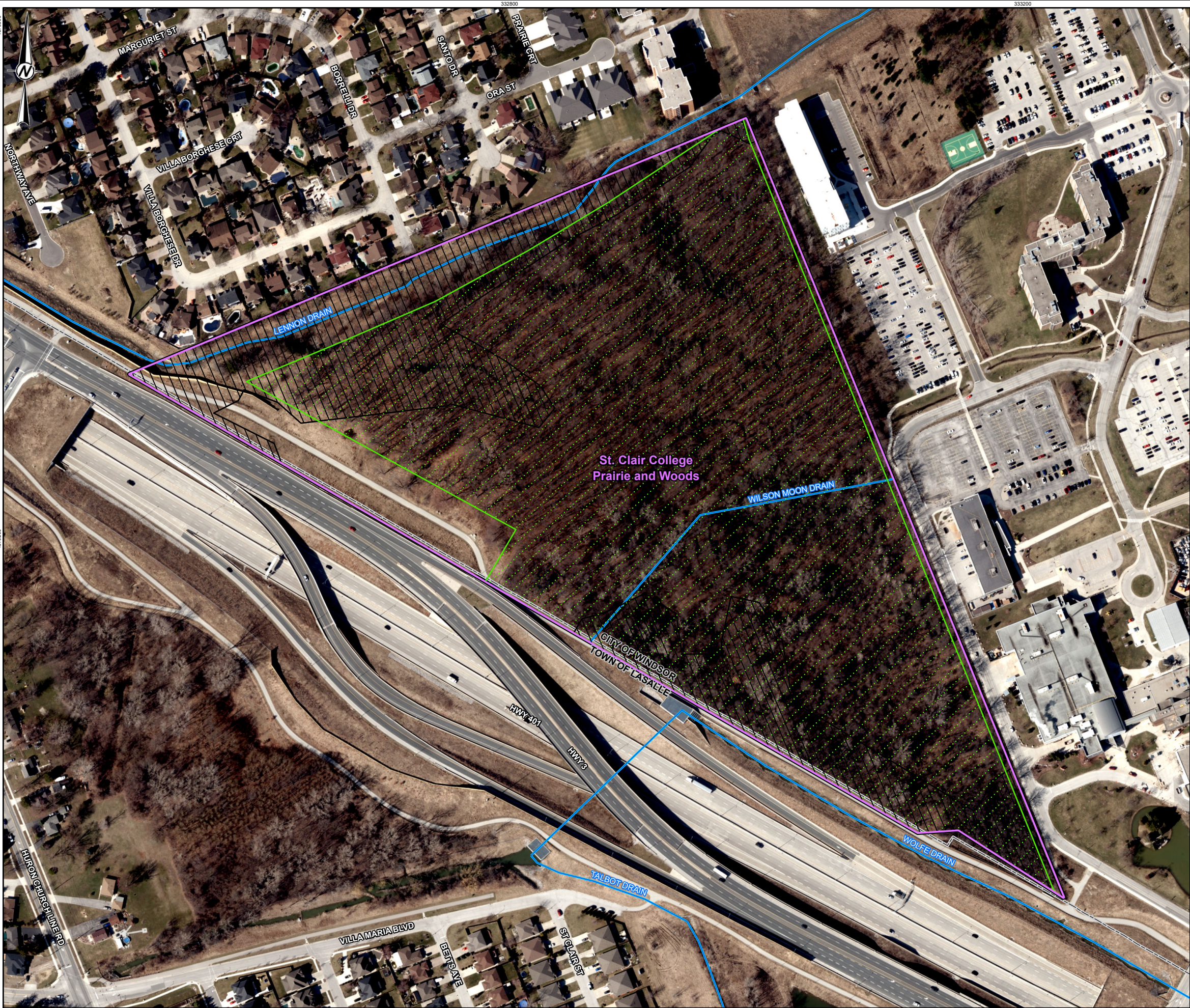
In addition to the rare plant communities above, St. Clair College Prairie and Woods also contains land with the Environmentally Significant Area designation as regulated by ERCA (Figure 3-36).

PLANT SAR AND PROVINCIALLY RARE SPECIES

In field surveys conducted by Pratt (1979 and 1991) and ERCA (1992 and 2008), 24 provincially rare plant species were recorded in St. Clair College Prairie and Woods, including three listed as SAR. A more recent review of verified and research grade sightings posted to iNaturalist also confirms the presence of three previously recorded species.

In addition to observed species in St. Clair College Prairie and Woods, a review of secondary source information from the NHIC indicates that many additional provincially rare species (including SAR) may occur within and/or around the site where suitable habitat exists (Appendix B).

Table 3-46: Plant SAR and Provincially Rare Species Observed in St. Clair College Prairie and Woods
(Removed to protect sensitive information)



LEGEND

- NATURAL HERITAGE REVIEW BOUNDARY
- REGULATION AREA (ESSEX REGION CONSERVATION AUTHORITY)
- ENVIRONMENTALLY SIGNIFICANT AREA
- MUNICIPAL DRAIN

0 60 120
1:3,000 METRES

REFERENCE(S)
COUNTY OF ESSEX, IMAGERY SERVICE: COUNTY 2022 AIRPHOTO, COUNTY 2021 AIRPHOTOMAP DATA © OPENSTREETMAP CONTRIBUTORS, MICROSOFT, FACEBOOK, INC. AND ITS AFFILIATES, ESRI COMMUNITY MAPS CONTRIBUTORS, MAP LAYER BY ESRI. LAND INFORMATION ONTARIO.
CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE – ONTARIO, CANADA.
PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N.

CLIENT

PROJECT
PROPOSED NATIONAL URBAN PARK IN WINDSOR
OJIBWAY PRAIRIE COMPLEX
NATURAL HERITAGE REVIEW REPORT

TITLE
**DESKTOP NATURAL HERITAGE REVIEW
ST. CLAIR COLLEGE PRAIRIE AND WOODS**

CONSULTANT	YYYY-MM-DD	2024-03-05
	DESIGNED	SS
	PREPARED	HB
	REVIEWED	
	APPROVED	

PROJECT NO.	CONTROL	REV.	FIGURE
IM22104012		C	3-36

3.3 WILDLIFE AND WILDLIFE HABITAT

This section includes the results of WSP's site-specific field surveys for anurans (frogs and toads) and bats in the natural areas. In addition, it includes the results of the secondary source review for the presence of other wildlife species, including occurrences of birds, other mammals, amphibians and reptiles, fish and terrestrial invertebrates, specifically provincially rare species and SAR, that have been recorded within the natural area boundaries.

3.3.1 ANURAN CALL SURVEYS AND OTHER HERPTILES

Anuran call surveys were conducted to characterize the nature, extent, and significance of anuran species within the natural areas. During surveys, a total of five species of anurans were documented from 15 point counts (Table 3-47). American Toad, Western Chorus Frog, Northern Leopard Frog, Green Frog and Gray Tree Frog were documented calling from suitable habitat at appropriate breeding times. As such, it is assumed these species successfully breed at or in the vicinity of all the survey stations. No SAR or provincially rare (S1-S3) species were recorded in the natural areas (the two SAR anurans in Ontario do not have ranges that overlap with the natural areas). The Gray Tree Frog may be considered locally significant in that the species was believed to occur in the area historically, however there have been no formal records indicating as such.

Table 3-47: Species Documented During Anuran Call Surveys

Natural Area	Station Number	April Survey	May Survey	June Survey
Black Oak Heritage Park Area	AM-BL01	Western Chorus Frog	American Toad	None
	AM-BL02	Western Chorus Frog	American Toad	None
	AM-BL03	Western Chorus Frog	American Toad Western Chorus Frog	None
Ojibway Park Area	AM-OJ01	Western Chorus Frog	American Toad Western Chorus Frog	Green Frog
	AM-OJ02	Western Chorus Frog	American Toad Western Chorus Frog	None
Ojibway Prairie Provincial Nature Reserve Area	AM-OPP01	Western Chorus Frog	American Toad Western Chorus Frog	None
	AM-OPP02	Western Chorus Frog	American Toad	None

Natural Area	Station Number	April Survey	May Survey	June Survey
Tallgrass Prairie Heritage Park Area	AM-TG01	Western Chorus Frog Northern Leopard Frog	American Toad Western Chorus Frog	None
Spring Garden Natural Area	AM-SG01	Western Chorus Frog	American Toad Western Chorus Frog	None
	AM-SG02	Western Chorus Frog	American Toad Western Chorus Frog	None
	AM-SG03	Western Chorus Frog	American Toad Western Chorus Frog	American Toad
Oakwood Natural Area	AM-OW01	Western Chorus Frog	American Toad Gray Tree Frog	None
South Cameron Woodlot Area	AM-SC01	Western Chorus Frog	American Toad Western Chorus Frog	None
	AM-SC02	Western Chorus Frog	Western Chorus Frog	Western Chorus Frog
Malden Park	AM-MP01	None	American Toad	American Toad

Anuran call data were assessed for trends in community composition, species distribution and abundance at each survey location. Of the five species recorded, the Western Chorus Frog was the most frequently recorded species with confirmed presence in all natural areas, with the exception of Malden Park. Additionally, based on call level, this species was the most abundant anuran recorded, especially in April. The American Toad was the next most frequently encountered and abundant species. It was recorded in all natural areas in May. The remaining three species were much less common. The Northern Leopard Frog was only heard calling in April at Tallgrass Prairie Heritage Park Area, the Gray Treefrog was only heard calling in May at Oakwood Park, and the Green Frog was only heard calling in June in Ojibway Park Area.

Four species (Western Chorus Frog, American Toad, Northern Leopard Frog and Green Frog) recorded in this study were also previously recorded in the Ojibway Shores (Gardner-Costa et al., 2017) and in the Ojibway Prairie Wetland Complex at survey stations associated with the Rt. Hon. Herb Gray Parkway project between 2012 – 2020. The only additional species noted in Ojibway Shores and the Ojibway Prairie Wetland Complex was American Bullfrog. A review of secondary source information indicates that only one other anuran species, Spring Peeper, has been recorded in the general area, but only in 1976 and 1986 (Ontario Reptile and Amphibian Atlas). An inventory of habitat features in the natural areas identified that the

swamp communities, vernal pools and shallow marshes present are suitable breeding habitat (seasonal standing water) for anurans.

Secondary sources, including previously completed work in the Windsor area by WSP (previously Wood), the City of Windsor (<https://ojibway.ca/herps.htm>), and others (Choquette & Valliant, 2016) documented the presence of eight snake species, of which some are historical occurrences only. Common snake species include Eastern Gartersnake, Red-bellied Snake, and Dekay's Brownsnake, which can be found in all the natural areas. Features such as large downed trees, debris piles and rock piles, crayfish and small mammal burrows, and wet depressions in open grasslands present suitable habitat for snakes.

Northern Watersnake was also frequently documented along the Detroit River.

The other four snake species present are listed as Endangered or Threatened in both Ontario and Canada. These four snake species also prefer prairie and savannah habitats.

Various sources and reports identify seven turtles species that can be found in the natural areas that contain suitable aquatic habitat or mating and/or nesting opportunities. Locally common species such as Midland Painted Turtle and Snapping Turtle occur in Black Oak Heritage Park Area, Ojibway Park Area, Tallgrass Prairie Heritage Park Area, Ojibway Prairie Provincial Nature Reserve Area, Spring Garden Natural Area, and Malden Park.

Four provincially rare and SAR turtles have also been recorded in Black Oak Heritage Park (Sage Earth 2019); Spring Garden Natural Area (Sage Earth and LGL Limited, 2016); Ojibway Park Area, Tallgrass Prairie Heritage Park Area, and Spring Garden Natural Area.

Further discussion on the occurrence of significant wildlife species and wildlife habitat is provided in Section 3.3.3 and Section 4.2.7 respectively, below.

3.3.2 BAT DETECTOR SURVEYS

Ultrasonic recording detectors and analysis of documented calls were conducted to determine the presence of bat species in the natural areas. There are four bat species identified as provincially at-risk in Ontario, but only one has occurrence data that overlaps the natural areas (Humphrey C., 2017; Humphrey and Fotherby, 2019). Further to this, COSEWIC recently published the results of a federal wildlife species assessment whereby the status of Eastern Red Bat (*Lasiurus borealis*), Hoary Bat (*Lasiurus cinereus*), and Silver-haired bat (*Lasionycteris noctivagans*) were all elevated to Endangered (May 2023). At the time of this report preparation, there were no changes to the SARA with respect to bat SAR. However, it is expected that COSEWIC will provide their assessment reports to the Federal Minister of the Environment and Climate Change in fall 2023 for listing consideration under the SARA, and subsequent publication on the Species at Risk Public Registry.

Four bat species were confirmed across all the natural areas in the following order of recorded frequency: Big Brown Bat (*Eptesicus fuscus*), Eastern Red Bat, Hoary Bat, and Silver-haired Bat. An unconfirmed species in the genus *Myotis* was recorded in Black Oak Heritage Park Area, Ojibway Park Area, and the Spring Garden Natural Area. One confirmed Little Brown Myotis was recorded in the Ojibway Park Area only. Based on the results of hourly

activity near the detectors, it appears that roosting sites may be present for Eastern Red Bat in Black Oak Heritage Park Area and Ojibway Park Area. Foraging habitat appears to be present in every natural area and there were likely a few fly routes detected in Black Oak Heritage Park Area, Ojibway Park Area, and the Tallgrass Prairie Heritage Park Area.

Site specific bat detector survey results are described for each natural area below. A summary of the results is provided in Table 3-56 at the end of this section.

3.3.2.1 Black Oak Heritage Park Area

The total number of bat passes per survey station were qualitatively compared across species and across the five survey station locations in Black Oak Heritage Park Area (Table 3-48). A complete account of bat passes and passes per hour by each species at each detector can be found in Appendix C.

During the first round of surveys from 27 May – 12 June, a total of 23,941 bat passes were recorded across three different survey stations (BL01, BL02, and BL03). Of these, 17.6% (4,210 passes) were by a high-frequency bat species, of which 65.0% (2,737 passes) were by the Eastern Red Bat and the remaining 35.0% (1,473 passes) could not be confidently identified to species. No bat passes were confirmed to be a SAR at this time.

Most passes during the first round of surveys were by low-frequency species, accounting for 82.4% (19,731 passes) of the total passes. The most frequently recorded low-frequency species was the Big Brown Bat, followed by the Hoary Bat, and then the Silver-haired Bat. These species accounted for 62.3% (12,300 passes), 16.4% (3,239 passes) and 9.4% (1,865 passes) of recorded passes, respectively. The remaining 11.8% (2,327 passes) of low-frequency passes could not be confidently identified to species (Table 3-48).

Monitoring during the second round of surveys ran from 14 June to 22 June at a single station (BL03), during which time a total of 4,340 bat passes were recorded (Table 3-48). Similar to the first survey round, none of these passes could be classified as a SAR species. Only 7.5% (325 passes) of the recorded passes were by a high-frequency bat species, of which 30.2% (98 passes) were by the Eastern Red Bat and 69.8% (227 passes) could not be confidently classified to species.

The remaining 4,015 passes were by low-frequency bats of which 10.9% (438 passes) were by the Hoary Bat, 9.1% (367 passes) were by the Silver-haired Bat, and 4.2% (170 passes) were by the Big Brown Bat. The remaining 75.7% (3,040 passes) of low-frequency passes could not be confidently classified to species (Table 3-48).

The third round of surveys ran from 4 July – 14 July at a single station (BL05) where 3,826 bat passes were recorded (Table 3-48). Contrary to the first two survey rounds, most (74% or 2,832 passes) of the bat passes were by high-frequency species. Of these, 11 passes were made by a species of the genus *Myotis* while the majority, 76.5% (2,167 passes) were made by the Eastern Red Bat. The remaining 23% (654 passes) of high-frequency passes could not be confidently classified to species. Of the 994 low-frequency passes, 69.7% (693 passes) were by the Big Brown Bat, 10.8% (107 passes) were by the Silver-haired bat, 5.1% (51 passes) were by the Hoary

Bat, and the remaining 14.4% (143 passes) could not be confidently classified to species (Table 3-48).

The hourly activity of all detected bat species and species groups during the first round of surveys was evenly distributed throughout the night, with exception of the Hoary Bat at survey station BL01. An even distribution of bat activity suggests that bats may be foraging in the area around the detectors. In the case of the Hoary Bat, their activity was concentrated in the first hour of the night which could indicate that site BL01 is located along a fly route to better foraging sites.

In the second round of surveys, activity was evenly distributed throughout the night for all detected species and species groups, again suggesting that detectors were in the vicinity of suitable foraging habitat in adjacent tallgrass prairie and meadows.

During the third survey round, the 11 *Myotis* passes recorded at survey station BL05 were only recorded during the second half of the night. Considering this distribution and the low number of confirmed passes by the detectors, it is unknown if and/or how *Myotis* species may be using habitat within Black Oak Heritage Park Area. Although bat SAR are not likely foraging or roosting, they may still appear in the larger surrounding area (see Ojibway Park Area and Spring Garden Natural Area below). It is also worth noting that activity of Eastern Red Bat peaked in the first couple hours and in the last hour of the night, with much lower activity throughout the night. This activity pattern suggests that one or more Eastern Red Bats were likely roosting in the forest near this survey station. This is further supported by the disproportionately high activity of this species at this station compared to all other stations. The activity of Big Brown Bat and Silver-haired Bat during the third survey was generally evenly distributed throughout the night, suggesting that these species were likely foraging in the vicinity of the detector.

Table 3-48: Bat Passes per Detector at Black Oak Heritage Park Area

Detector Site	Round	Recorded Period	<i>Myotis</i> Species	Eastern Red Bat	High Frequency Bat Species	Big Brown Bat	Silver- haired Bat	Hoary Bat	Low Frequency Bat Species
BA-BL01	1	1 June – 12 June	0	1,510	1,048	8,313	628	1,118	730
BA-BL02	1	1 June – 12 June	0	994	379	2,742	320	1,316	1,146
BA-BL03	1	27 May – 12 June	0	233	46	1,245	917	805	451
BA-BL04	2	14 June – 22 June	0	98	227	170	367	438	3,040
BA-BL05	3	4 July – 14 July	11	2,167	654	693	107	51	143
Total Passes per Species/Species Group	1	27 May – 12 June	0	2,737	1,473	12,300	1,865	3,239	2,327
Total Passes per Species/Species Group	2	14 June – 22 June	0	98	227	170	367	438	3,040
Total Passes per Species/Species Group	3	4 July – 14 July	11	2,167	654	693	107	51	143

3.3.2.2 Ojibway Park Area

The total number of bat passes per survey station were qualitatively compared across species and across the six survey station locations (Table 3-49). A complete account of bat passes and passes per hour by each species at each detector can be found in Appendix C.

During the first round of surveys from 31 May – 13 June, a total of 11,349 bat passes were recorded across four different survey locations (OJ01, OJ02, OJ03 and OJ04). Of these, 30.0% (3,400 passes) were by a high-frequency bat species, of which 68.0% (2,312 passes) were by the Eastern Red Bat. One bat pass was confirmed to be a Little Brown Myotis (SAR) and an additional 84 passes were classified as a *Myotis* species at station OJ04. One pass by a *Myotis* species was also recorded at stations OJ02 and OJ03. The remaining 29.4% (1,001 passes) could not be confidently identified to species (Table 3-49).

Most passes during the first round of surveys were by low-frequency species, accounting for 70.0% (7,949 passes) of the total passes. The most frequently recorded low-frequency species was the Big Brown Bat, followed by the Hoary Bat, and then the Silver-haired Bat. These species accounted for 57.7% (4,585 passes), 6.8% (539 passes) and 6.1% (483 passes) of the recorded passes, respectively. The remaining 29.4% (2,341 passes) of low-frequency passes could not be confidently identified to species (Table 3-49).

The second round of surveys ran from 23 June – 14 July at two survey locations (OJ05 and OJ06). A total of 10,177 bat passes were recorded (Table 3-49). Only 13% (1,298 passes) of bat passes were by high-frequency species. Of these, two passes were by a species of the genus *Myotis* while the majority, 84% (1,083 passes), were by the Eastern Red Bat. The remaining 16% (213 passes) of high-frequency passes could not be confidently classified to species. Of the 8,879 low-frequency passes, 80.2% (7,120 passes) were by the Big Brown Bat, 6.2% (549 passes) were by the Hoary Bat, and 6% (533 passes) were by the Silver-haired Bat. The remaining 7.6% (677 passes) could not be confidently classified to species (Table 3-49).

With respect to bat SAR, the 84 *Myotis* passes recorded at station OJ04 were distributed evenly over the course of the night suggesting that *Myotis* might be using habitat, perhaps for foraging, in the vicinity of this detector. The single passes of *Myotis* species at other detectors always occurred in the latter half of the night, suggesting that *Myotis* species may only periodically pass through the area and are not roosting or foraging in the vicinity of those detectors.

The hourly activity of all other bat species and species groups during both rounds of surveys was generally evenly distributed throughout the night. These results suggest that bats may be using habitat in the vicinity of the detectors for foraging. There were only a few instances where, depending on the survey station location, Big Brown Bat activity trended higher in the earlier evening hours compared to the later evening hours. In addition, in the first survey round, station OJ04 may have been in the vicinity of an Eastern Red Bat roosting site based on the hourly activity concentrated in the beginning and at the end of the evening. In addition, at OJ01, the activity of Big Brown Bat, Hoary Bat, and other low-frequency bats was concentrated in the first hour or two of the evening with no activity afterwards, suggesting that this station is potentially located along a fly route to better foraging sites. Nonetheless,

the amount of bat activity near detectors placed in Ojibway Park Area suggests that suitable habitat is present for all the recorded bat species in the open tallgrass prairie and mature Oak woodland, forest, and swamp.

Table 3-49: Bat Passes per Detector in Ojibway Park Area

Detector Site	Round	Recorded Period	Little Brown Myotis	<i>Myotis</i> Species	Eastern Red Bat	High Frequency Bat Species	Big Brown Bat	Silver-haired Bat	Big Brown Bat or Silver-haired Bat	Hoary Bat	Low Frequency Bat Species
BA-OJ01	1	31 May – 12 June	0	0	0	1	37	3	0	43	234
BA-OJ02	1	31 May – 12 June	0	1	88	205	821	120	1	209	405
BA-OJ03	1	31 May – 12 June	0	1	50	127	987	164	0	76	1,315
BA-OJ04	1	1 June – 13 June	1	84	2,174	668	2,740	196	0	211	387
BA-OJ05	2	23 June – 4 July	0	1	1,049	181	4,517	443	0	472	464
BA-OJ06	2	23 June – 4 July	0	1	34	32	2,603	90	0	77	213
Total Passes per Species/Species Group	1	31 May – 13 June	1	86	2,312	1,001	4,585	483	1	539	2,341
Total Passes per Species/Species Group	2	23 June – 4 July	0	2	1,083	213	7,120	533	0	549	677

3.3.2.3 Tallgrass Prairie Heritage Park Area

The total number of bat passes per survey station were qualitatively compared across species and across the three survey station locations (Table 3-50). A complete account of bat passes and passes per hour by each species at each detector can be found in Appendix C.

During the first round of site surveys from 14 June – 24 June, a total of 12,738 bat passes were recorded across two survey locations (TG01 and TG02). Of these, 11.6% (1,475 passes) were by a high-frequency bat species, of which 41.9% (618 passes) were by the Eastern Red Bat and the remaining 58.1% (657 passes) could not be confidently identified to species (Table 3-50).

Most passes were by low-frequency species, accounting for 88.4% (11,263 passes) of the total passes. The most frequently recorded low-frequency species was the Big Brown Bat, followed by the Hoary Bat, and then the Silver-haired Bat. These species accounted for 51.6% (5,810 passes), 14.3% (796 passes) and 6.1% (124 passes) of recorded passes, respectively. The remaining 31.1% (481 passes) of low-frequency passes could not be confidently identified to species (Table 3-50).

The second round of surveys ran from 4 July – 14 July at one monitoring location (TG03) where 4,891 bat passes were recorded (Table 3-50). A total of 50.4% (2,464 passes) of bat passes were by high-frequency species. Of these, the majority, 95.7% (2,357 passes), were by the Eastern Red Bat. The remaining 4.3% (107 passes) of high-frequency passes could not be confidently classified to species. Of the 2,427 low-frequency passes, 42.2% (1,026 passes) were by the Big Brown Bat, 32.8% (796 passes) were by the Hoary Bat, and 5.1% (124 passes) were by the Silver-haired Bat. The remaining 19.8% (481 passes) could not be confidently classified to species.

With respect to bat SAR, none of the high-frequency bat passes could be confidently identified as a SAR during the two rounds of surveys. While some of the passes may have been produced by a SAR, the disproportionately large number of Eastern Red Bat passes compared to no passes of *Myotis* species suggests that most, if not all, the unclassified high-frequency passes were likely Eastern Red Bat.

The hourly activity of all detected bat species and species groups during both surveys was generally evenly distributed throughout the night. There were a few instances where, depending on the survey station location, one or more species of the low-frequency bats tended to be more active in the earlier monitoring hours and less active in the later monitoring hours. In addition, the activity of Eastern Red Bat (a high-frequency bat species) at TG03 was concentrated in the first hour of the night, suggesting that this station is located along a fly route to better foraging sites for this species. Nonetheless, activity at all the survey stations does indicate that bats use the habitat in Tallgrass Prairie Heritage Park Area, especially for foraging in the open meadows and tallgrass ecosystems.

Table 3-50: Bat Passes per Detector in Tallgrass Prairie Heritage Park Area

Detector Site	Round	Recorded Period	<i>Myotis</i> Species	Eastern Red Bat	High Frequency Bat Species	Big Brown Bat	Silver- haired Bat	Hoary Bat	Low Frequency Bat Species
BA-TG01	1	14 June – 24 June	0	308	561	3,151	194	34	1,287
BA-TG02	1	14 June – 24 June	0	310	296	2,659	139	1,582	2,217
BA-TG03	2	4 July – 14 July	0	2,357	107	1,026	124	796	481
Total Passes per Species/Species Group	1	14 June – 24 June	0	618	857	5,810	333	1,616	3,504
Total Passes per Species/Species Group	2	4 July – 14 July	0	2,357	107	1,026	124	796	481

3.3.2.4 Ojibway Prairie Provincial Nature Reserve Area

The total number of bat passes per survey station were qualitatively compared across species and across the five survey station locations in the Nature Reserve Area (Table 3-51). A complete account of bat passes and passes per hour by each species at each detector can be found in Appendix C.

During the first round of surveys from 1 June to 12 June, a total of 4,456 bat passes were recorded across two different survey stations (OPP01 and OPP02). Of these, only 6.8% (304 passes) were by high-frequency bat species, of which 72.4% (220 passes) were by the Eastern Red Bat and the remaining 27.6% (84 passes) could not be confidently identified to species. No bat passes were confirmed to be a SAR at this time (Table 3-51).

Most passes in the first round of surveys were by low-frequency species, accounting for 93.1% (4,152 passes) of the total passes. The most frequently recorded low-frequency species was the Big Brown Bat, followed by the Hoary Bat, and then the Silver-haired Bat. These species accounted for 44.3% (1,387 passes), 25.9% (1,074 passes) and 8.1% (338 passes) of recorded passes, respectively. The remaining 21.7% (901 passes) of low-frequency passes could not be confidently identified to species (Table 3-51).

Monitoring during the second round ran from 14 June to 24 June across two different survey stations (OPP03 and OPP04). A total of 5,751 bat passes were recorded (Table 3-51). Approximately 18.4% (1,058 passes) of the recorded passes were by high-frequency bat species, of which 30.7% (325 passes) were by the Eastern Red Bat and 69.3% (733 passes) could not be confidently classified to species. None of the high-frequency passes could be confidently classified as a SAR. The remaining 4,693 passes were by low-frequency bats, of which 30.9% (1,450 passes) were by the Big Brown Bat, 27.2% (1,278 passes) were by the Hoary Bat, and 3.7% (174 passes) were by the Silver-haired Bat. The remaining 38.2% (1,791 passes) of low-frequency passes could not be confidently classified to species (Table 3-51).

The third round of surveys ran from 4 July – 14 July at a single survey station (OPP05) where 3,454 bat passes were recorded (Table 3-51). Approximately 9.1% (316 passes) of the recorded passes were by high-frequency bat species, of which 86.7% (274 passes) were by the Eastern Red Bat and 13.3% (42 passes) could not be confidently classified to species. Of the 3,138 low-frequency passes, 44.2% (1,387 passes) were by the Big Brown Bat, 27.2% (853 passes) were by the Hoary Bat, and 6.7% (210 passes) were by the Silver-haired bat. The remaining 21.9% (688 passes) could not be confidently classified to species (Table 3-51).

With respect to bat SAR, none of the high-frequency bat passes could be confidently identified as a SAR during the three rounds of surveys. While some of these passes may have been produced by a SAR, the disproportionately large number of Eastern Red Bat passes compared to no passes of *Myotis* species suggests that most, if not all, the unclassified high-frequency passes were likely Eastern Red Bat.

The hourly activity of all detected bat species and species groups during all rounds of surveys was generally evenly distributed throughout the night. There were only a few instances where, depending on the survey station location, Big Brown Bat and/or Hoary Bat (i.e. low-

frequency bats) tended to be more active in the earlier monitoring hours and less active in the later monitoring hours. Nonetheless, the amount of bat activity near detectors in the Nature Reserve Area suggests that suitable foraging habitat is present for all recorded species in the open tallgrass prairie and woodland.

Table 3-51: Bat Passes per Detector in Ojibway Prairie Provincial Nature Reserve Area

Detector Site	Round	Recorded Period	<i>Myotis</i> Species	Eastern Red Bat	High Frequency Bat Species	Big Brown Bat	Silver- haired Bat	Hoary Bat	Low Frequency Bat Species
BA-OPP01	1	1 June – 12 June	0	105	62	352	118	560	505
BA-OPP02	1	1 June – 12 June	0	115	22	1,487	220	514	396
BA-OPP03	2	14 June – 24 June	0	133	322	931	123	1,087	1,224
BA-OPP04	2	14 June – 24 June	0	192	411	519	51	191	567
BA-OPP05	3	4 July – 14 July	0	274	42	1,387	210	853	688
Total Passes per Species/Species Group	1	1 June – 12 June	0	220	84	1,839	338	1,074	901
Total Passes per Species/Species Group	2	14 June – 24 June	0	325	733	1,450	174	1,278	1,791
Total Passes per Species/Species Group	3	4 July – 14 July	0	274	42	1,387	210	853	688

3.3.2.5 Spring Garden Natural Area

The total number of bat passes per survey station were qualitatively compared across species and across the seven survey station locations (Table 3-52). A complete account of bat passes and passes per hour by each species at each detector can be found in Appendix C.

During the first round of surveys from 1 June to 12 June, a total of 12,648 bat passes were recorded across three different survey stations (SG01, SG02 and SG03). Only 5.7% (723 passes) were by high-frequency bat species, most of which (79.3% or 573 passes) were by Eastern Red Bat. One pass was identified as a *Myotis* species, and 2 passes were recorded as either an Eastern Red Bat or a Tricolored Bat (*Perimyotis subflavus*). The remaining 20.3% (147 passes) of high-frequency passes could not be confidently identified to species (Table 3-52).

Most passes were by low-frequency bat species, accounting for 94.3% (11,925 passes) of the total passes. The most frequently recorded low-frequency species was the Big Brown Bat, followed by the Hoary Bat, and then the Silver-haired Bat. These species accounted for 35.9% (4,283 passes), 26.9% (3,207 passes) and 8.5% (1,016 passes) of the recorded passes, respectively. The remaining 28.7% (3,419 passes) of low-frequency passes could not be confidently identified to species (Table 3-52).

Monitoring during the second round ran from 14 June to 24 June at two locations (SG04 and SG05) during which a total of 9,562 bat passes were recorded (Table 3-52). Approximately 19.3% (1,849 passes) of the recorded passes were by high-frequency species, of which 32.3% (598 passes) were the Eastern Red Bat and 67.7% (1,251 passes) could not be confidently classified to species. The remaining 7,713 passes were by low-frequency species, of which 28% (2,156 passes) were the Big Brown Bat, 14.2% (1,099 passes) were the Hoary Bat, and 9% (694 passes) were the Silver-haired Bat. The remaining 48.8% (3,764 passes) of low-frequency passes could not be confidently classified to species (Table 3-52).

The third round of surveys ran from 29 June – 14 July at two locations (SG06 and SG07) where 12,491 bat passes were recorded (Table 3-52). Different than the first two survey rounds, 44% or 5,493 passes were by high-frequency species. Of these, 93% (5,110 passes) were classified as the Eastern Red Bat. One pass was by a species of the genus *Myotis*, and four passes were recorded as either an Eastern Red Bat or a Tricoloured Bat. The remaining 6.9% (378 passes) of high-frequency passes could not be confidently classified to species. However, given the disproportionately large number of Eastern Red Bat passes compared to the very low number of *Myotis* passes, most if not all the unclassified high-frequency passes were likely Eastern Red Bat.

Of the 6,998 low-frequency passes, 37% (2,592 passes) were by the Big Brown Bat, 24.5% (1,718 passes) were by the Hoary Bat, and 15.4% (1,076 passes) were by the Silver-haired bat. The remaining 23% (1,612 passes) could not be confidently classified to species (Table 3-52).

With respect to bat SAR, during the first and third round of the surveys, species of the genus *Myotis* were only detected on two nights, one in early June (one pass) and one in early July (one pass). Considering the low number of confirmed passes by the detectors, it is unknown if and/or how *Myotis* species may be using habitat within the Spring Garden Natural Area.

Although bat SAR are not likely foraging or roosting, they still appear to occur in the larger surrounding area.

With the exception of *Myotis*, the hourly activity of all detected bat species and species groups during all survey periods was generally evenly distributed throughout the night. There were a few instances where, depending on the survey station location, one or more species of the low-frequency bats tended to be more active in the earlier monitoring hours and less active in the later monitoring hours. Nonetheless, the activity at all the survey stations appears to indicate that bats are foraging over the pond, in open meadow/tallgrass prairie, and along the Turkey Creek/Grand Marais Drain corridor in the vicinity of the detectors.

Table 3-52: Bat Passes per Detector in Spring Garden Natural Area

Detector Site	Round	Recorded Period	<i>Myotis</i> Species	Eastern Red Bat	Eastern Red Bat / Tricolored Bat	High Frequency Bat Species	Big Brown Bat	Silver- haired Bat	Hoary Bat	Low Frequency Bat Species
BA-SG01	1	1 June – 12 June	0	75	0	58	910	244	364	1,886
BA-SG02	1	1 June – 12 June	1	221	2	45	1,394	340	790	547
BA-SG03	1	1 June – 12 June	0	277	0	44	1,979	432	2,053	986
BA-SG04	2	14 June – 24 June	0	558	0	1,027	1,899	646	817	2,969
BA-SG05	2	14 June – 24 June	0	40	0	224	257	48	282	795
BA-SG06	3	29 June – 11 July	0	3,144	3	176	1,248	365	494	385
BA-SG07	3	4 July – 14 July	1	1,966	1	202	1,344	711	1,224	1,227
Total Passes per Species/Species Group	1	1 June – 12 June	1	573	2	147	4,283	1,016	3,207	3,419
Total Passes per Species/Species Group	2	14 June – 24 June	0	598	0	1,251	2,156	694	1,099	3,764
Total Passes per Species/Species Group	3	29 June – 14 July	1	5,110	4	378	2,592	1,076	1,718	1,612

3.3.2.6 Oakwood Natural Area

The total number of bat passes at one survey station established in the Oakwood Natural Area were qualitatively compared across species (Table 3-53). A complete account of bat passes and passes per hour by each species can be found in Appendix C.

Acoustic monitoring occurred from 14 June – 18 June at one monitoring location, OW01. A total of 1,932 bat passes were recorded. Of these, 4.8% (92 passes) were by a high-frequency bat species, of which 43.5% (40 passes) were by the Eastern Red Bat and the remaining 56.5% could not be confidently identified to species (Table 3-53).

Most passes were by low-frequency species, accounting for 95.2% (1,840 passes) of the total passes. The most frequently recorded low-frequency species was the Big Brown Bat, followed by the Hoary Bat, and then the Silver-haired Bat. These species accounted for 18.6% (343 passes), 18.5% (340 passes) and 7.9% (146 passes) of the recorded passes, respectively. The remaining 54.9% (1,011 passes) of low-frequency passes could not be confidently identified to species (Table 3-53).

With respect to bat SAR, none of the high-frequency bat passes could be confidently identified as a SAR during the survey. While some of these may have been produced by a SAR bat, the disproportionately large number of Eastern Red Bat passes compared to no passes of *Myotis* suggests that most, if not all, the unclassified high-frequency passes were likely Eastern Red Bat.

The hourly activity of all detected bat species and species groups was generally evenly distributed throughout the night. This trend tends to indicate that bats were likely using the open meadow habitat in the vicinity of the detector for foraging.

Table 3-53: Bat Passes per Detector in Oakwood Natural Area

Detector Site	Round	Recorded Period	<i>Myotis</i> Species	Eastern Red Bat	High Frequency Bat Species	Big Brown Bat	Silver- haired Bat	Hoary Bat	Low Frequency Bat Species
BA-OW01	1	14 June – 18 June	0	40	52	343	146	340	1,011
Total Passes per Species/Species Group	1	14 June – 18 June	0	40	52	343	146	340	1,011

3.3.2.7 South Cameron Woodlot Area

The total number of bat passes per survey station were qualitatively compared across species and across the two station locations (Table 3-54). A complete account of bat passes and passes per hour by each species at each detector can be found in Appendix C.

During surveys conducted from 13 June – 22 June, a total of 11,448 bat passes were recorded across two different survey stations (SC01 and SC02). Of these, 7.3% (835 passes) were by high-frequency bat species, of which 8.6% (72 passes) were by the Eastern Red Bat and the remaining 91.4% (763 passes) could not be confidently identified to species (Table 3-54).

Most passes were by low-frequency species, accounting for 92.7% (10,613 passes) of the total passes. The most frequently recorded low-frequency species was the Big Brown Bat, followed by the Hoary Bat, and then the Silver-haired Bat. These species accounted for 38.6% (4,094 passes), 7.4% (789 passes) and 1.4% (152 passes) of the recorded passes, respectively. The remaining 52.6% (5,578 passes) of low-frequency passes could not be confidently identified to species (Table 3-54).

With respect to bat SAR, none of the high-frequency bat passes could be confidently identified as a SAR during the survey. While some of these passes may have been produced by a SAR, the number of known Eastern Red Bat passes compared to no passes of *Myotis* species suggests that most, if not all, the unclassified high-frequency passes were likely Eastern Red Bat.

The hourly activity of all detected bat species and species groups was generally evenly distributed throughout the night. This trend tends to indicate that bats were likely using the swamp, open meadow, and other habitats in the vicinity of the detectors for foraging.

Table 3-54: Bat Passes per Detector in South Cameron Woodlot Area

Detector Site	Round	Recorded Period	<i>Myotis</i> Species	Eastern Red Bat	High Frequency Bat Species	Big Brown Bat	Silver- haired Bat	Hoary Bat	Low Frequency Bat Species
BA-SC01	1	13 June – 16 June	0	47	195	810	82	180	1,188
BA-SC02	1	13 June – 22 June	0	25	568	3,284	70	609	4,390
Total Passes per Species/Species Group	1	13 June – 22 June	0	72	763	4,094	152	789	5,578

3.3.2.8 Malden Park

The total number of bat passes per survey station were qualitatively compared across species and across the three survey locations (Table 3-55). A complete account of bat passes and passes per hour by each species at each detector can be found in Appendix C.

During the first round of site surveys from 21 June – 4 July, a total of 16,512 bat passes were recorded across two different survey locations (MP01 and MP02). Of these, 22.2% (3,664 passes) were by a high-frequency bat species, of which 75.6% (2,772 passes) were by the Eastern Red Bat and the remaining 24.4% could not be confidently identified to species (Table 3-55).

Most passes were by low-frequency species, accounting for 77.8% (12,848 passes) of the total passes. The most frequently recorded low-frequency species was the Big Brown Bat, followed by the Hoary Bat, and then the Silver-haired Bat. These species accounted for 56.0% (7,193 passes), 24.6% (3,155 passes) and 6.1% (781 passes) of recorded passes, respectively. The remaining 13.4% (1,719 passes) of low-frequency passes could not be confidently identified to species (Table 3-55).

The second round of surveys ran from 30 June – 8 July at one monitoring location (MP03) where 8,436 bat passes were recorded (Table 3-55). A total of 36.5% (3,076 passes) were by high-frequency bat species. Of these, the majority, 89.4% (2,751 passes), were by the Eastern Red Bat. The remaining 10.6% (325 passes) of high-frequency passes could not be confidently identified to species. Of the 5,360 low-frequency passes, 61.7% (3,305 passes) were by the Big Brown Bat, 16.7% (898 passes) were by the Hoary Bat, and 9% (481 passes) were by the Silver-haired bat. The remaining 12.6% (676 passes) could not be confidently identified to species (Table 3-55).

With respect to bat SAR, none of the high-frequency bat passes could be confidently identified as a SAR during the surveys. While some of these may have been produced by a SAR, the disproportionately large number of Eastern Red Bat passes compared to no passes of *Myotis* species suggests that most, if not all, the unclassified high-frequency passes were likely Eastern Red Bat.

The hourly activity of all detected bat species and species groups was generally evenly distributed throughout the night, indicating that bats were likely using habitat in Malden Park for foraging, especially over the pond, open meadow, and other habitats in the vicinity of the detectors.

Table 3-55: Bat Passes per Detector in Malden Park

Detector Site	Round	Recorded Period	<i>Myotis</i> Species	Eastern Red Bat	High Frequency Bat Species	Big Brown Bat	Silver-haired Bat	Hoary Bat	Low Frequency Bat Species
BA-MP01	1	21 June – 30 June	0	2,702	869	6,267	438	2,246	1,125
BA-MP02	1	23 June – 4 July	0	70	23	926	343	909	594
BA-MP03	2	30 June – 8 July	0	2,751	325	3,305	481	898	676
Total Passes per Species/Species Group	1	21 June – 4 July	0	2,772	892	7,193	781	3,155	1,719
Total Passes per Species/Species Group	2	30 June – 8 July	0	2,751	325	3,305	481	898	676

3.3.2.9 Summary of Automated and Manually Vetted Classification of Echolocation Calls

Table 3-56 includes a summary of all bat passes detected by acoustic monitors by species and site. Overall, the most frequently encountered high-frequency bat species was the Eastern Red Bat (24,107 passes). The Eastern Red Bat was present in all natural areas and was also the species most likely responsible for making the high-frequency passes that could not be confidently identified to species by the automated software. These passes were more likely to be from Eastern Red Bat than a *Myotis* species (102 passes) or Tricolored Bat (6 passes) given their disproportionate number of passes in the sites.

Overall, the most frequently encountered low-frequency bat species was the Big Brown Bat (60,346 passes). The Big Brown Bat was present in all natural areas and was responsible for making the most passes of any known species in each site, with exception of Oakwood Natural Area where the number of Big Brown Bat passes was very similar to Hoary Bat passes (343 to 340 passes respectively). The second most encountered low-frequency species was the Hoary Bat (21,639 passes) followed by the Silver-haired Bat (8,880 passes). Both of these species were present in each of the natural areas; with the number of Hoary Bat passes always exceeding the number of Silver-haired Bat passes. Regarding the unidentified low-frequency bat passes, these passes could belong to any of the confirmed species and are likely to be consistent with the relative proportions of the Big Brown Bat, Hoary Bat and Silver-haired Bat passes.

As noted in the sections above, the results of acoustic monitoring appear to indicate that a variety of suitable habitats are present across the natural areas to support the activities of multiple bat species, including that of potential bat SAR. The placement of bat detectors has confirmed the use of adjacent areas as foraging habitat, as well as potential roosting habitat and potential flight paths.

Table 3-56: Results from Automated and Manually Vetted Classification of Echolocation Calls

	Species	Black Oak Heritage Park Area	Ojibway Park Area	Ojibway Prairie Provincial Nature Reserve Area	Tallgrass Prairie Heritage Park Area	Spring Garden Natural Area	Oakwood Natural Area	South Cameron Woodlot Area	Malden Park	Total
High-Frequency Species	MYLU*	0	1	0	0	0	0	0	0	1
	MYSE*	0	0	0	0	0	0	0	0	0
	MYLE*	0	0	0	0	0	0	0	0	0
	<i>Myotis</i> sp.	11	88	0	0	2	0	0	0	101
	PESU*	0	0	0	0	0	0	0	0	0
	LABO	5,002	3,395	819	2,975	6,281	40	72	5,523	24,107
	LABO.PESU	0	0	0	0	6	0	0	0	6
	HiFspp	2,354	1,214	859	964	1,776	52	763	1,217	9,199
Low- Frequency Species	LACI	3,728	1,088	3,205	2,412	6,024	340	789	4,053	21,639
	LANO	2,339	1,016	722	457	2,786	146	152	1,262	8,880
	EPFU	13,163	11,705	4,676	6,836	9,031	343	4,094	10,498	60,346
	LANO.EPFU	0	1	0	0	0	0	0	0	1
	LoFspp	5,510	3,018	3,380	3,985	8,795	1,011	5,578	2,395	33,672
	Unknown	0	0	0	0	0	0	0	0	0
	TOTAL	32,107	21,526	13,661	17,629	34,701	1,932	11,448	24,948	157,952

Note(s)

1. * denotes Species at Risk
2. MYLU = Little Brown Myotis (*Myotis lucifugus*)
3. MYSE = Northern Myotis (*Myotis septentrionalis*)
4. MYLE = Eastern Small-footed Myotis (*Myotis leibii*)
5. PESU = Tricolored Bat (*Perimyotis subflavus*)
6. LABO = Eastern Red Bat (*Lasiurus borealis*)
7. LABO.PESU = Either of the two
8. HiFspp = High-frequency Species
9. LACI = Hoary Bat (*Lasiurus cinereus*)
10. LANO = Silver-haired Bat (*Lasionycteris noctivagans*)
11. EPFU = Big Brown Bat (*Eptesicus fuscus*)
12. LANO.EPFU = Either of the two
13. LoFspp = Low-frequency Species

3.3.3 OTHER WILDLIFE SPECIES

There is considerable data on wildlife sightings from wildlife atlases, citizen science (eBird, iNaturalist, Bioblitz), and environmental reports that have been completed in the natural areas over the decades. The primary focus of this section, however, is on provincially rare species and provincially and federally-listed SAR that have been recorded and documented within the natural area boundaries. The sources of information for these known occurrences include site-specific reports, occurrences documented by Ojibway Nature Centre staff, verified and research grade sightings posted to iNaturalist, and WSP's incidental observation records. Rare species and SAR tracked by the NHIC or reported in the OBBA, Butterfly Atlas and ORAA provided additional occurrence information for rare species and SAR known to be present in the vicinity of the natural areas, i.e., where grids and buffer areas overlap the natural area boundaries. In these instances, the additional species potentially present in the natural areas are provided in the list in Appendix B.

Common wildlife species observed as incidental sightings during WSP's field surveys are summarized in Appendix A.

3.3.3.1 Ojibway Shores

In 2017, ERCA and the Essex County Field Naturalists Club conducted faunal inventories of Ojibway Shores and documented all wildlife species encountered during visual, audio and cover board surveys and searches (Gardner-Costa, et al., 2017).

Overall, a total of 141 species of birds were recorded on the property, which is over half of the 252 total species recorded in the Ojibway Prairie Complex. The list of bird species includes nine with a provincial rarity rank and 11 provincial and/or federal SAR.

There were also 117 terrestrial invertebrate species documented during the natural heritage assessment (Gardner-Costa, et al., 2017), including the new discovery of a rare insect associated with Ontario's tallgrass prairie ecosystems. One insect SAR was seen on the site both as both larva and adults indicating the species utilizes the area for their life cycle. Only one reptile SAR was observed on the site and there were no rare or SAR mammals recorded.

A review of the verified and research grade sightings of rare wildlife posted to iNaturalist indicates one additional reptile SAR has been recorded in Ojibway Shores.

Lastly, in addition to the species known to occur in Ojibway Shores, a review of secondary source information from the NHIC and rare species lists from the OBBA, e-Bird, ORRA and the Butterfly Atlas indicate many more rare species and SAR may occur within and/or around Ojibway Shores where suitable habitat occurs (Appendix B).

Table 3-57: Wildlife SAR and Provincially Rare Species Observed in Ojibway Shores

(Removed to protect sensitive information)

3.3.3.2 Black Oak Heritage Park Area

In field surveys conducted by Oldham (1983), ERCA (1992) and most recently Sage Earth (2019), wildlife species in Black Oak Heritage Park Area were identified through direct observation, vocalizations, and other evidence such as scat, tracks and browse. In addition, WSP reviewed the City's species list for the park, the Forest Bird Monitoring Program (FBMP; 1988-1994) results, as well as all verified, and research grade sightings of rare wildlife posted to iNaturalist and added these sightings to the list of SAR and rare species (Table 3-58).

The list of bird species recorded in Black Oak Heritage Park Area includes 16 with a provincial rarity rank and a total of eight provincial and/or federal SAR. There are also three provincial and/or federal reptile SAR known to occur. There have been no rare or SAR mammal species recorded on the site; however, it is important to note that one bat SAR was recorded during acoustic monitoring in summer 2022, as well as three bat species which COSEWIC has recently assessed as Endangered (May 2023).

The terrestrial invertebrate species recorded in Black Oak Heritage Park Area are diverse, with 27 rare dragonflies, damselflies, moths, and butterflies recorded. Two rare snail species have been recorded, including one SAR. One rare spider and one rare wasp have also been recorded. There is one SAR butterfly.

WSP also recorded incidental occurrences of wildlife during field visits in summer 2022 (Appendix A). Ten species of birds, two mammals and two amphibian species were noted. One provincially rare bird was observed.

In addition to the rare species/SAR known to occur in Black Oak Heritage Park Area, a review of secondary source information from the NHIC and rare species lists from the OBBA, e-Bird, ORRA and the Butterfly Atlas indicate many more may occur within and/or around the Park area where suitable habitat occurs. These additional rare species/SAR are included for reference in Appendix B.

Table 3-58: Wildlife SAR and Provincially Rare Species Observed in Black Oak Heritage Park Area

(Removed to protect sensitive information)

3.3.3.3 Ojibway Park Area

Rare wildlife species are frequently documented in Ojibway Park Area by staff at the Ojibway Nature Centre and Park visitors. Table 3-59 below includes a list of the provincially rare and SAR wildlife that are known to occur in the park from the City's species list and verified/research grade sightings posted to iNaturalist.

The list of bird species recorded in Ojibway Park Area includes 22 with a provincial rarity rank and 14 provincial and/or federal SAR. There are also five provincial and/or federal reptile SAR known to occur. There have been no rare or SAR mammal species recorded on the site; however, it is important to note that one bat SAR was recorded during acoustic monitoring

in summer 2022, as well as three bat species which COSEWIC has recently assessed as Endangered (May 2023).

The terrestrial invertebrate species recorded in Ojibway Park Area are diverse, with 31 rare dragonflies, damselflies, moths and butterflies, grasshoppers, crickets, and katydids recorded. There has been one SAR butterfly observed.

WSP also recorded incidental occurrences of wildlife during field visits in summer 2022 (Appendix A). Fifteen birds, five mammals, four reptiles and three amphibian species were noted. Two turtle SAR were also observed.

In addition to the rare species/SAR known to occur in Ojibway Park Area, a review of secondary source information from the NHIC and rare species lists from the OBBA, e-Bird, ORRA and the Butterfly Atlas indicate many more may occur within and/or around the Park area where suitable habitat occurs. These additional rare species/SAR are included for reference in Appendix B.

Table 3-59: Wildlife SAR and Provincially Rare Species Observed in Ojibway Park Area
(Removed to protect sensitive information)

3.3.3.4 Tallgrass Prairie Heritage Park Area

In natural heritage assessments conducted by ERCA in 1992 and 2008, wildlife species present in the Tallgrass Prairie Heritage Park Area were surveyed and identified through direct observations and vocalizations during three seasonal surveys. In addition to these reports, the City of Windsor completed an environmental study of Tallgrass Prairie Heritage Park Area as part of the natural heritage planning process (City of Windsor 2001). Since those studies, much of the site-specific and publicly available wildlife sightings have been posted to on-line biodiversity databases such as iNaturalist. WSP reviewed the verified and research grade sightings of rare wildlife in the natural area and added these sightings to the list of SAR and rare species (Table 3-60).

Results of the bird surveys in Tallgrass Prairie Heritage Park Area produced the highest number of migrant and breeding bird observations of any of the 14 natural heritage sites assessed by ERCA in their study (2008). The Tallgrass Prairie Heritage Park Area ranked the highest of all sites in avifaunal species diversity, with 93 species observed, 20 species confirmed breeding, 15 species possibly/probably breeding and approximately 2,000 total birds counted. Of the species recorded, 14 have a provincial rarity rank and 13 are designated a provincial and/or federal SAR.

There are also six provincial and/or federal reptile SAR known to occur.

There have been no rare or SAR mammal species recorded in the Tallgrass Prairie Heritage Park Area; however, it is important to note that three bat species recorded during summer 2022 acoustic monitoring were recently assessed by COSEWIC as Endangered (May 2023).

The terrestrial invertebrate species recorded in the natural area are diverse, with 21 rare dragonflies, damselflies, moths, butterflies, spiders, and a rare crayfish recorded. There was one SAR butterfly observed.

WSP also recorded incidental occurrences of wildlife during field visits in summer 2022 (Appendix A). Three birds, three mammals, three reptiles and three amphibian species were noted. One federal SAR was observed, as well one provincially rare bird.

In addition to the rare species/SAR known to occur in the Tallgrass Prairie Heritage Park Area, a review of secondary source information from the NHIC and rare species lists from the OBBA, e-Bird, ORRA and the Butterfly Atlas indicate many more may occur within and/or around the natural area where suitable habitat exists. These additional rare species/SAR are included for reference in Appendix B.

Table 3-60: Wildlife SAR and Provincially Rare Species Observed in Tallgrass Prairie Heritage Park Area

(Removed to protect sensitive information)

3.3.3.5 Ojibway Prairie Provincial Nature Reserve Area

Wildlife species recorded in the Ojibway Prairie Provincial Natural Reserve were primarily sourced from the City's species list for the area and from verified and research grade sightings posted to iNaturalist. WSP reviewed both General Natural Areas Reports for the Nature Reserve Area (MNR, 2021a and 2021b), but there was no wildlife information included and the Ojibway Prairie Wetland Evaluation contained only redacted locational information for rare species, which could have also been found in the Tallgrass Prairie Heritage Park Area and/or the Spring Garden Natural Area. Therefore, the rare wildlife species listed in Table 3-61 that have been recorded specifically in the Ojibway Prairie Provincial Nature Reserve Area relies heavily on citizen science at this time.

The list of bird species recorded in the Nature Reserve Area includes 17 with a provincial rarity rank and eight provincial and/or federal SAR.

There have been no rare or SAR mammal species recorded in the Ojibway Prairie Provincial Nature Reserve Area; however, it is important to note that three bat species recorded during summer 2022 acoustic monitoring were recently assessed by COSEWIC as Endangered (May 2023).

The terrestrial invertebrate species recorded in the Nature Reserve Area are diverse, with 31 rare dragonflies and damselflies, moths and butterflies, a wasp and fly, grasshoppers, spiders, and two rare crayfish recorded. There was one SAR butterfly observed.

WSP also recorded incidental occurrences of wildlife during field visits in summer 2022 (Appendix A). Seven birds, two mammals, three reptiles and three amphibian species were noted. One provincially rare bird and one provincial bird SAR were observed. One reptile SAR was also observed.

In addition to the rare species/SAR known to occur in the Ojibway Prairie Provincial Nature Reserve Area, a review of secondary source information from the NHIC and rare species lists from the OBBA, e-Bird, ORRA and the Butterfly Atlas indicate many more may occur within and/or around the Nature Reserve Area where suitable habitat occurs. These additional rare species/SAR are included for reference in Appendix B.

Table 3-61: Wildlife SAR and Provincially Rare Species Observed in Ojibway Prairie Provincial Nature Reserve Area

(Removed to protect sensitive information)

3.3.3.6 Spring Garden Natural Area

WSP summarized all the confirmed sightings of provincially rare and SAR wildlife in Spring Garden Natural Area from reports and on-line databases (Oldham, 1983; ERCA, 1992; City of Windsor, 1996; LGL Limited and Sage Earth, 2016; Wood, 2021b; and iNaturalist). Wildlife species were recorded primarily from visual observations and vocalizations during biological inventories (Oldham, 1983 and ERCA, 1992), vegetation community mapping and SAR searches (LGL Limited and Sage Earth, 2016) and vegetation management and monitoring activities (Wood, 2021b, 2021c, and 2021d).

The list of bird species recorded in the Spring Garden Natural Area includes 24 with a provincial rarity rank and 11 provincial and/or federal SAR. There are also six provincial and/or federal reptile SAR known to occur.

There is one historical occurrence of a SAR mammal. Other than this species, one bat SAR was recorded during acoustic monitoring in summer 2022, and three bat species which COSEWIC has recently assessed as Endangered (May 2023).

The terrestrial invertebrate species recorded in the Natural Area are diverse, with 28 rare dragonflies and damselflies, moths, butterflies, grasshoppers, and others. There was one SAR butterfly observed.

WSP also recorded incidental occurrences of wildlife during field visits in summer 2022 (Appendix A). Fourteen birds, one mammal, two reptiles and two amphibian species were noted. Two snake SAR were observed, as well as three provincially rare birds.

In addition to the rare species/SAR known to occur in the Spring Garden Natural Area, a review of secondary source information from the NHIC and rare species lists from the OBBA, e-Bird, ORRA and the Butterfly Atlas indicate many more may occur within and/or around the natural area where suitable habitat exists. These additional rare species/SAR are included for reference in Appendix B.

Table 3-62: Wildlife SAR and Provincially Rare Species Observed in Spring Garden Natural Area

(Removed to protect sensitive information)

3.3.3.7 Oakwood Natural Area

The Oakwood Stewardship Study (Biological Inventory and Recommendations) was the first comprehensive study creating a baseline for plants and wildlife in a large portion of the Oakwood Natural Area (Lum et al., 1995). The study included birds, mammals, reptiles and amphibians, dragonflies and damselflies, butterflies, moths, and other insects. Wildlife was recorded from visual observations, vocalizations, directed searches, netting (insects only), nocturnal vocalizations (birds) and moth lights, and live mammal traps (Table 3-63).

WSP also reviewed the City's species list and all verified and research grade sightings of wildlife species recently posted to iNaturalist, focusing on the provincially rare species and SAR within the natural area and added those sightings to the list of known SAR and rare species.

Of the 103 bird species recorded in the Oakwood Natural Area by Lum et al. (1995), 16 have a provincial rarity rank and 10 are provincial and/or federal SAR. Two provincial and federal reptile SAR have also been observed.

There have been no rare or SAR mammals recorded in the Oakwood Natural Area; however, it is important to note that three bat species were recorded during summer 2022 acoustic monitoring. These species were recently assessed by COSEWIC and elevated to the status of Endangered (May 2023). The terrestrial invertebrate species recorded in Oakwood Natural Area are all common species, except three that are provincially rare. There is one butterfly SAR.

WSP recorded incidental occurrences of wildlife during field visits in summer 2022 (Appendix A). Five birds, one mammal, two reptiles and two amphibian species were noted. Two snake SAR were observed.

In addition to the rare species/SAR known to occur in the Oakwood Natural Area, a review of secondary source information from the NHIC and rare species lists from the OBBA, e-Bird, ORRA and the Butterfly Atlas indicate many more may occur within and/or around the natural area where suitable habitat exists. These additional rare species/SAR are included for reference in Appendix B.

Table 3-63: Wildlife SAR and Provincially Rare Species Observed in Oakwood Natural Area

(Removed to protect sensitive information)

3.3.3.8 South Cameron Woodlot Area

In natural heritage evaluations conducted by ERCA in 1992 and 2008, faunal inventories in the South Cameron Woodlot Area focused on direct observations and vocalizations of bird species only, no other wildlife were recorded at the time. As such, WSP also reviewed all verified and research grade sightings of other wildlife species, including reptiles and amphibians, mammals and insects recently posted to iNaturalist. WSP focused on the

provincially rare species and SAR within the woodlot and surrounding natural area and added those sightings to the list of known SAR and rare species.

Results of previous bird surveys in the South Cameron Woodlot Area identified 35 different species, 12 confirmed breeding, and 5 possibly/probably breeding. Of the species recorded, five have a provincial rarity rank and one was designated a provincial and/or federal SAR. There were also two provincial and federal reptile SAR; one butterfly SAR; one rare damselfly; one rare moth; and one rare crayfish reported to iNaturalist.

There have been no rare or SAR mammals recorded in the South Cameron Woodlot Area; however, it is important to note that three bat species were recorded during summer 2022 acoustic monitoring. These species were recently assessed by COSEWIC and elevated to the status of Endangered (May 2023).

WSP also recorded incidental occurrences of wildlife during field visits in summer 2022 (Appendix A). Three birds, two mammals and three amphibian species were noted. Two bird SAR were recorded.

In addition to the rare species/SAR known to occur in the South Cameron Woodlot Area, a review of secondary source information from the NHIC and rare species lists from the OBBA, e-Bird, ORRA and the Butterfly Atlas indicate many more may occur within and/or around the natural area where suitable habitat exists. These additional rare species/SAR are included for reference in Appendix B.

Table 3-64: Wildlife SAR and Provincially Rare Species Observed in the South Cameron Woodlot Area

(Removed to protect sensitive information)

3.3.3.9 Malden Park

Although ERCA included Malden Park in their candidate natural heritage biological inventories in the early 1990's, the focus at that time was on flora and vegetation communities. There have been no formal wildlife studies completed by the City or others at Malden Park; however, the accessibility of the Park has made it a popular place for citizen science. Many Park visitors post their wildlife sightings to publicly available scientific databases such as iNaturalist and eBird.

A review of the City's species list and verified and research grade sightings of rare wildlife posted to iNaturalist indicate there are 6 bird species with a provincial rarity rank and four designated provincial and/or federal SAR. There are also two provincial and/or federal reptile SAR and one butterfly SAR known to occur.

There have been no rare or SAR mammal species recorded in Malden Park; however, it is important to note that three bat species were recorded during summer 2022 acoustic monitoring. These species were recently assessed by COSEWIC and elevated to the status of Endangered (May 2023).

WSP also recorded incidental occurrences of wildlife during field visits in summer 2022 (Appendix A). Four birds, four mammals and three amphibian species were noted. No provincially rare species or SAR were observed.

In addition to the rare species/SAR known to occur in Malden Park, a review of secondary source information from the NHIC and rare species lists from the OBBA, e-Bird, ORRA and the Butterfly Atlas indicate many more may occur within and/or around Malden Park where suitable habitat occurs. These additional rare species/SAR are included for reference in Appendix B.

Table 3-65: Wildlife SAR and Provincially Rare Species Observed in Malden Park

(Removed to protect sensitive information)

3.3.4 OTHER NATURAL AREAS

Wildlife observations in Chappus Natural Area and St. Clair College Prairie and Woods have been compiled from secondary sources including publicly available natural heritage studies, lists and databases. A summary of wildlife species occurrences from these resources is provided below. Wildlife field surveys would be helpful in providing up-to-date information for these sites.

3.3.4.1 Chappus Natural Area

Wildlife species recorded in the Chappus Natural Area were primarily sourced from verified and research grade sightings posted to iNaturalist and SAR that are included in the Parkway ESA permits (Table 3-66). These species include three provincial and/or federal reptile SAR and 16 rare terrestrial invertebrate species, including one SAR. No other rare wildlife species have been reported in publicly available information to date.

In addition to the species known to occur in the Chappus Natural Area, a review of secondary source information from the NHIC and rare species lists from the OBBA, e-Bird, ORRA and the Butterfly Atlas indicates that many additional provincially rare species (including SAR) may occur within and/or around the Chappus Natural Area where suitable habitat exists (Appendix B).

Table 3-66: Wildlife SAR and Provincially Rare Species Observed in Chappus Natural Area

(Removed to protect sensitive information)

3.3.4.2 St. Clair College Prairie and Woods

Field surveys conducted by ERCA in St. Clair College Prairie and Woods in 1992 focused primarily on the plant species present in the property. In 2008, wildlife species were recorded from visual observations and vocalizations during the updated biological inventories (ERCA 2008). There were six bird species with a provincial rarity rank and four designated provincial

and/or federal SAR. No other rare wildlife species were recorded at the time. A review of current verified and research grade sightings of rare wildlife posted to iNaturalist indicates one SAR butterfly has been observed.

In addition to the species known to occur in the St. Clair College Prairie and Woods, a review of secondary source information from the NHIC and rare species lists from the OBBA, e-Bird, ORRA and the Butterfly Atlas indicate many more rare species and SAR may occur within and/or around the property where suitable habitat occurs (Appendix B).

Table 3-67: Wildlife SAR and Provincially Rare Species Observed in St. Clair College Prairie and Woods

(Removed to protect sensitive information)

4 EVALUATION OF SIGNIFICANCE

The section below is an evaluation of significant natural heritage features potentially present within the natural areas being considered for the Ojibway NUP project. The features included in this evaluation are taken from the Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005. Second Edition (MNR, 2010); the Significant Wildlife Habitat Technical Guide (MNRF, 2022); and Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (MNRF, 2015). Although the Manual and reference guides are primarily considered tools for municipalities and other approval/ planning authorities to develop processes to implement the Provincial Policy Statement (PPS) natural heritage policies (MMAH, 2020), they are also intended for use by ecologists, biologists, environmental planners, and others involved in the identification of significant natural heritage features and areas, their protection and integration into broader functioning Natural Heritage Systems.

In short, the Natural Heritage Reference Manual outlines a system-based approach for the protection of specific natural heritage features and areas and applies additional information on the technical criteria and approaches to effectively implement the requirements of the PPS. The SWH Technical Guide and Habitat Criteria Schedules provide the specific information and necessary detail on the identification, description, and prioritization of SWH.

WSP has evaluated the relevant components of the Natural Heritage Reference Manual and SWH criteria with respect to their presence in each of the natural areas. A description of these components and summary of the findings is provided below.

4.1 SPECIES OF CONSERVATION CONCERN, INCLUDING SPECIES AT RISK

In Ontario, Species of Conservation Concern include SAR and rare and rapidly declining species. SAR are species whose individuals or populations are considered Extirpated (EXT), Endangered (END), Threatened (THR), or Special Concern (SC), as determined by the provincial COSSARO and the federal COSEWIC.

Results of the desktop natural heritage screening, literature review and field surveys indicate that both SAR and provincially rare species are present in each of the natural areas evaluated in this study. In addition, the potential for additional SAR and rare species to occur within the natural areas is high based on the results of the NHIC search, the known habitat preferences/needs for each species, and the presence of preferred habitat in the natural areas.

Site-specific occurrences of SAR and provincially rare species are included in Sections 3.2 (plants) and Section 3.3 (wildlife) above, and the broader results of NHIC queries are provided in Appendix B. All the natural areas included in this study have at least one SAR present (plant and/or wildlife) and may contain habitat that supports additional species.

4.2 NATURAL HERITAGE FEATURES

4.2.1 AREAS OF NATURAL AND SCIENTIFIC INTEREST (ANSI)

ANSI are defined in the PPS as “areas of land and water containing natural landscapes or features that have been identified as having life science or earth science values related to protection, scientific study or education.” Life science ANSI are significant representative segments of Ontario’s biodiversity and natural heritage. Provincially significant life science ANSI include the most significant and best examples of the natural heritage features in the province (MNR, 2010).

There are two ANSI that span six of the natural area boundaries. These are summarized in Table 4-1 below with figure numbers provided herein. The only sites that do not contain life science ANSI are Oakwood Natural Area, South Cameron Woodlot Area, Malden Park, Chappus Natural Area, and St. Clair College Prairie and Woods.

Table 4-1: Life ANSI Locations within the Natural Heritage Assessment Study Area

ANSI Name		Location
Prairie Remnants Life ANSI	Black Oak Woods	• Ojibway Shores (Figure 3-2) • Black Oak Heritage Park Area (Figure 3-4)
	Ojibway Park	• Ojibway Park Area (Figure 3-8)
	Titcombe Rd. North	• Tallgrass Prairie Heritage Park Area (Figure 3-12)
	Southeast of Nature Reserve	• Ojibway Prairie Provincial Nature Reserve Area (Figure 3-20)
	Spring Garden Forest	• Spring Garden Natural Area (Figure 3-16)
Ojibway Prairie Provincial Nature Reserve ANSI		• Ojibway Prairie Provincial Nature Reserve Area (Figure 3-20)

4.2.2 WETLANDS

There are two general types of wetlands present in the City natural areas, swamps and marshes. Swamps are the most common wetland type and where present, comprise a notable amount of the overall habitat present in the site. They are dominated by trees and shrubs and support a wide diversity of vegetation and wildlife. Marshes are the least common wetland type and make up a relatively small percentage of the overall habitat present in the sites where they occur.

PSW are those areas identified by the province as being the most valuable. They are determined by a science-based ranking system known as the Ontario Wetland Evaluation System (OWES). This framework provides a standardized method of assessing wetland functions and societal values, which enables the province to rank wetlands relative to one another. This information is provided to planning authorities to support the land use planning process.

There are four mapped PSW within the natural areas. These include the Black Oak Wetland Complex, Ojibway Prairie Wetland Complex, Oakwood Wetland Complex and South Cameron Wetland Complex. These wetlands are shown in their respective sites in the figures included in Section 3.2. The PSW largely overlap with swamp ELC vegetation communities, such as Pin Oak Mineral Deciduous Swamp and Swamp White Oak Mineral Deciduous Swamp.

4.2.3 SIGNIFICANT WOODLANDS

Significant Woodland means an area that is ecologically important in terms of features such as species composition, age of trees and stand history; functionally important due to its contribution to the broader landscape because of its location, size or due to the amount of forest cover in the planning area; or economically important due to site quality, species composition, or past management history. These are to be identified using criteria established by the MNRF (MMAH, 2020). The Ministry of Natural Resources (MNR) has established the following criterion to determine significance and states that woodlands that meet a suggested minimum standard for any one of the criteria listed below should be considered significant (MNR, 2010).

1. Woodland Size Criteria: The Woodland Size Criteria bases significance based on the size of the 'parcel' in the context of forest cover in the region/county. Essex County and Chatham-Kent County have less than 5 percent forest cover (MNR, 2010), and therefore any 'parcel' over 2 ha in size should be considered significant.
2. Ecological Functions Criteria:
 - a. Woodland interior: Under the woodland interior section, any 'parcel' with any interior habitat in any county with less than 15% forest cover is considered significant. Interior habitat is measured as the area within a 'parcel' 100 m from the edge.
 - b. Proximity to other woodlands or other habitats: Under proximity to other woodlands or other habitats section considers the 'parcel' significant if it is close to other significant natural areas or significant natural heritage features.
 - c. Linkages: Woodlands should be considered significant if they are located within a defined natural heritage system or provide a connecting link between two other significant features.
 - d. Water protection: Woodlands should be considered significant if they are located within a sensitive or threatened watershed or in proximity to sensitive

groundwater discharge, sensitive recharge, sensitive headwater area, watercourse, or fish habitat. Review of the Essex Region Source Protection Plan mapping and the Ministry of Environment, Conservation and Parks (MECP) mapping for significant groundwater recharge areas indicates that all the natural areas between the Detroit River and Highway 401 are identified as significant.

- e. Woodland diversity: Woodland habitat loss is one of the most serious threats to biological diversity. Woodlands should be considered significant if they have a naturally occurring composition of native forest species that have declined significantly or have a high native diversity through a combination of composition and terrain (i.e. SAR and rare species presence). Older woodlands (i.e., woodlands >100 yrs old) are particularly valuable. Characteristics of older woodlands/woodlands with large tree structure could be defined as having 10 or more trees/ha >100 yrs old or 10 or more trees/ha at least 50 cm in diameter.
- 3. Uncommon Characteristics Criteria: Woodlands should be considered significant if they have a unique species composition; a vegetation community with a provincial ranking; habitat of rare, uncommon, and/or restricted plant species; and are characterized as older communities.
 - 4. Economic and Social Functional Values Criteria: Economic and Social Functional Values Criteria considers woodlands with high-value ecosystem services, such as air-quality improvement or recreation (passive and active), to be significant if those services exist at a sustainable level.

A review of the online woodland data layer from the MNRF indicates the mapping of woodlands in Ojibway Shores, Black Oak Heritage Park Area, Ojibway Prairie Provincial Nature Reserve Area, Tallgrass Prairie Heritage Park Area, Spring Garden Natural Area, Oakwood Natural Area, South Cameron Woodlot Area, the southeastern portion of Malden Park, portions of Chappus Natural Area, and all of St. Clair College Prairie and Woods. Although significance of these areas is not designated by the Province, it is a starting point in the planning process. To determine significance, WSP considered the results of this natural heritage assessment in the context of the above listed criteria. WSP has completed a summary table of the significance criteria met by each of the natural areas (Table 4-2).

Table 4-2: Significant Woodland Criteria Summary in the Natural Heritage Assessment Study Area

Natural Area	Functional Criteria					Uncommon Characteristics	Economic/ Social Values
	Size (>2ha)	Interior Habitat	Proximity to/ Linkage to Significant Features	Water Protection	Diversity		
Ojibway Shores	X	X	X	X	X	X	X
Black Oak Heritage Park Area	X	X	X	X	X	X	X
Ojibway Park Area	X	X	X	X	X	X	X
Tallgrass Prairie Heritage Park Area	X	X	X	X	X	X	X
Ojibway Prairie Provincial Nature Reserve Area	X	X	X	X	X	X	X
Spring Garden Natural Area	X	X	X	X	X	X	X
Oakwood Natural Area	X	X	X	N/A	X	X	X
South Cameron Woodlot Area	X	X	X	N/A	X	X	X
Malden Park	X	N/A	X	X	X	X	X
Chappus Natural Area	X	N/A	X	X	X	X	X
St. Clair College Prairie and Woods	X	X	X	X	X	X	X

4.2.4 SIGNIFICANT VALLEYLANDS

Valleylands are a natural area that occurs in a valley or other landform depression that has water flowing through or standing for some period of the year. Based on the results of this natural heritage assessment, there are no valleylands present in any of the natural areas.

4.2.5 FISH HABITAT

Fish habitat is defined in the *Fisheries Act*, and under the PPS, it means spawning grounds and any other areas, including nursery, rearing, food supply, and migration areas on which fish depend directly or indirectly in order to carry out their life processes. Based on the results of this assessment, there is fish habitat present in the Detroit River (immediately adjacent to Ojibway Shores), Turkey Creek/Grand Marais Drain (which runs through the Spring Garden Natural Area and southern portion of Ojibway Prairie Provincial Nature Reserve Area) and Broadway Drain (along the northern boundary of Ojibway Shores and Black Oak Heritage Park Area to the Detroit River). Fish SAR have been documented in secondary sources in these watercourses as well (Appendix B). Other municipal drains such as Titcombe Drain, Basin Drain and Lennon Drain may contain fish habitat and/or seasonal fish habitat along portions of their reaches (URS, 2008), while other smaller municipal drains likely do not.

4.2.6 ADJACENT LANDS

Adjacent lands are the lands relevant to which impacts must be considered and the compatibility of a development proposal must be addressed. The extent of adjacent lands may vary, depending on such factors as hydrology, topography, soil conditions, potential disruption of wildlife movement patterns, land use and other features (MNR, 2010). Planning authorities may also define adjacent lands. The City of Windsor OP states that the identification of adjacent lands will be determined on a site-specific basis by the Municipality, in consultation with the province and/or ERCA, and in accordance with policy 10.2.5.4 of this Plan. Policy 10.2.5.4 states that provincial policies will be fulfilled.

Adjacent lands typically encompass a distance of 120 m from a feature or area for which potential impacts are being assessed. Should any future work be proposed within or adjacent to the natural areas, the consideration of potential impacts from those works on adjacent lands must also be considered.

4.2.7 SIGNIFICANT WILDLIFE HABITAT

SWH is considered of provincial significance in Ontario. Development in SWH is prohibited unless it can be demonstrated that development will have no negative impact on features and functions. Wildlife habitat is considered “significant” if it is deemed ecologically important in terms of feature, function, representation or amount, and contributes to the quality and diversity of an identifiable geographic area or Natural Heritage System (MMAH, 2020). Within Ecoregion 7E, criteria for evaluating SWH are provided in MNRF Ecoregion schedules for Ecoregion 7E (MNRF, 2015). Other provincial documents used to identify and

assess SWH are the Natural Heritage Resource Manual (MNR, 2010), the SWH Technical Guide (MNRF, 2022), and the Significant Wildlife Habitat Mitigation Support Tool (SWHMiST) (MNRF, 2014). According to the Significant Wildlife Habitat Criteria Schedule for Ecoregion 7E (MNRF, 2015), SWH may consist of:

- Seasonal Concentration Areas for Animals;
- Rare Vegetation Communities;
- Specialized Habitat for Wildlife;
- Habitat for Species of Conservation Concern; and
- Animal Movement Corridors.

SWH has been evaluated for the natural areas as discussed below. Habitats not discussed below were evaluated as not present, as either habitat requirements or species are not present. The Significant Wildlife Habitat Screening document is provided in Appendix D.

4.2.7.1 Seasonal Concentration Areas

Seasonal concentration areas are those where wildlife species occur annually in aggregations at certain times of the year. Such areas are sometimes highly concentrated with members of a given species, or several species, within relatively small areas. Some wildlife species will concentrate where they can rest and feed and other wildlife species require habitats where they can survive winter (MNRF, 2015). The sections below refer to the occurrence of specific species and habitat requirements that constitute SWH consideration and are present in the natural areas.

RAPTOR WINTERING – CANDIDATE

Two raptor indicator species have been observed by WSP and others in Ojibway Shores, Black Oak Heritage Park Area, Ojibway Park Area, Tallgrass Prairie Heritage Park Area, Ojibway Prairie Provincial Nature Reserve Area, Spring Garden Natural Area and/or Malden Park. In addition, species that are not tracked by the NHIC have been recorded in secondary source information (i.e., eBird, iNaturalist, and Ojibway Prairie Complex Species List) in the Ojibway Prairie Complex, as well as Ojibway Shores, South Cameron Woodlot Area, and/or St. Clair College Prairie and Woods.

Habitat for this type of SWH is defined as >20 ha with a combination of forest (FOD) and upland communities (CUM, CUW, CUT, CUS). Based on known and potential species occurrences and ELC vegetation communities present in the natural areas, Raptor Wintering SWH is considered “Candidate” in the following natural areas: Ojibway Shores (as it is contiguous with Black Oak Heritage Park Area), Black Oak Heritage Park Area, Ojibway Park Area, Tallgrass Prairie Heritage Park Area, Ojibway Prairie Provincial Nature Reserve Area, Spring Garden Natural Area, and South Cameron Woodlot Area.

BAT MATERNITY COLONIES – CANDIDATE

Both indicator species were recorded by bat detectors placed in each of the following natural areas: Black Oak Heritage Park Area, Ojibway Park Area, Tallgrass Prairie Heritage Park Area, Ojibway Prairie Provincial Nature Reserve Area, Spring Garden Natural Area, Oakwood Natural Area, South Cameron Woodlot Area and Malden Park. Based on the activity recorded by the detectors, it is believed that each of the natural areas represents an important foraging site, but maternity colonies were not confirmed. The required habitat type, mature deciduous forest (FOD) and swamp (SWD), occurs in each of these natural areas. To qualify as suitable habitat, the forest and/or swamp must have >10 large diameter (>25 cm DBH) wildlife trees per hectare. Wildlife trees were not inventoried; however, it was assumed the density of trees (per ELC methodology), sub-sampling of large, old trees (>50 cm DBH), and the estimation of stand age would fit the criteria. This SWH type is considered “Candidate” as maternity colonies were not confirmed in the natural areas; however, based on acoustic recordings, maternity colonies could be present in all the sites.

TURTLE WINTERING AREAS – CANDIDATE AND CONFIRMED (OJIBWAY PARK AREA)

The three turtle indicator species have been recorded in one or more of the following natural areas: Ojibway Shores, Black Oak Heritage Park Area, Ojibway Park Area, Tallgrass Prairie Heritage Park Area, Ojibway Prairie Provincial Nature Reserve Area, Spring Garden Natural Area, and Malden Park. For most turtles, their overwintering habitat is in the same general area as their core habitat. The overwintering habitat is a permanent water feature that is deep enough not to freeze in the winter and has a soft-bottom substrate. The ELC communities that support overwintering turtles are those in SW (swamps), MA (marsh), OA (open water) and SA (Shallow Water). Deeper rivers or streams also support overwintering of one of the indicator species. One or more of these ELC communities are present in each of the above listed natural areas where turtles have been observed, and the Detroit River and Turkey Creek provide potentially suitable habitat. Although site-specific surveys for overwintering or basking/congregating turtles were not undertaken, the frequent number of recorded occurrences in these sites, as well as potentially suitable habitat, indicates that overwintering turtles are most likely present. In the Ojibway Park Area, City staff have confirmed overwintering turtles in their ponds (ELC community Open Aquatic, OA).

REPTILE HIBERNACULUM – CANDIDATE AND CONFIRMED (SPRING GARDEN NATURAL AREA & OJIBWAY PRAIRIE PROVINCIAL NATURE RESERVE AREA)

One or more occurrences of indicator snake species have been documented in all of the natural areas evaluated in this study. Potential snake hibernacula were frequently observed during ELC mapping, including small mammal burrows, cray fish burrows, rock piles, debris piles, root structures of large trees and constructed hibernacula from house foundations (Spring Garden Natural Area). Scientific studies have confirmed the presence of hibernacula in Spring Garden Natural Area (URS, 2008 and LGL Limited and Sage Earth, 2016) and Ojibway Prairie Provincial Nature Reserve Area (K. Cedar, 2023 personal communication).

Although confirmatory hibernaculum studies were not undertaken as part of this assessment, the common occurrence of snakes and a variety of potential hibernacula features in the natural areas indicates that this SWH is present.

4.2.7.2 Rare Vegetation Communities or Specialized Habitat for Wildlife

Rare vegetation communities often contain rare species, particularly plants and small invertebrates, which depend on such habitats for their survival and cannot readily move to or find alternative habitats. One of the most important criteria for determining a rare vegetation community is the current representation of the community within a planning area based on its area relative to the total landscape, or the number of examples within the planning area. NHIC uses a system that considers the provincial rank of a species or community type as a tool to prioritize protection efforts (the sub-national or s-rank) (MNRF, 2015).

Below is a brief description of the rare vegetation communities confirmed within the natural areas as detailed above in Section 3.2 text and figures. Note that a robust species inventory was not completed for this study, but ELC vegetation community mapping and secondary sources were utilized. It is likely that additional rare and specialized habitat types or locations may occur within the natural areas.

OLD GROWTH FOREST – CANDIDATE

In the SWH criteria, Old Growth Forests are characterized by heavy mortality or turnover of over-storey trees resulting in a mosaic of gaps that encourage the development of a multi-layered canopy and an abundance of snags and downed woody debris. Any deciduous forest (FOD) or deciduous swamp (SWD) community or combined communities can be considered. The area considered must have a dominant tree species >140 yrs old and be ≥30 ha or with at least 10 ha of interior habitat (assuming a 100 m buffer at the edge of the forest). The forested area containing the old growth characteristics must also have experienced no recognizable forestry activities (i.e. no cut stumps present).

Deciduous forest and swamp communities are present in the natural areas and an evaluation of large trees and mature growth forests was undertaken for this report (Section 2.2.6). It was found that Black Oak Heritage Park Area, Ojibway Park Area, Tallgrass Prairie Heritage Park Area, Ojibway Prairie Provincial Nature Reserve Area, Spring Garden Natural Area, Oakwood Natural Area, South Cameron Woodlot Area, and Malden Park all have large, individual trees old enough to meet the age criteria and suitable ELC communities with old growth characteristics. All these sites, with exception of Oakwood Natural Area and Malden Park, had relatively large areas of mature woodland and/or swamp habitat over 75 years ago, based on historical aerial imagery. However, further analysis is needed, especially in the smaller natural areas to determine the spatial relationship between old trees and habitat area criteria in order to be confirmed as SWH.

TALLGRASS PRAIRIE – CONFIRMED (BLACK OAK HERITAGE PARK AREA, OJIBWAY PARK AREA, TALLGRASS PRAIRIE HERITAGE PARK AREA, OJIBWAY PRAIRIE PROVINCIAL NATURE RESERVE AREA, SPRING GARDEN NATURAL AREA, OAKWOOD NATURAL AREA, AND CHAPPUS NATURAL AREA)

A Tallgrass Prairie has ground cover dominated by prairie grasses and has <25% tree cover. This plant community is known to be extremely rare in Ontario (Rogers, 1998). There is no size to be considered significant; however, the site must not be dominated by exotic or introduced species (<50% vegetative cover by exotic species). The ELC ecosites that may

qualify as rare prairie communities include Dry Tallgrass Prairie (TPO1) and Fresh – Moist Tallgrass Prairie (TPO2). In addition, in accordance with Appendix N of the SWH Technical Guide, many of the listed indicator species have been confirmed present in these communities.

The rare Tallgrass Prairie communities mapped and confirmed as part of this study include both Dry Tallgrass Prairie Type (TPO1-1; G3/S1) and Fresh – Moist Tallgrass Prairie Type (TPO2-1; G2/S1). These communities are found in Black Oak Heritage Park Area, Ojibway Park Area, Tallgrass Prairie Heritage Park Area, Ojibway Prairie Provincial Nature Reserve Area, Spring Garden Natural Area, Oakwood Natural Area, and Chappus Natural Area.

TALLGRASS SAVANNAH – CONFIRMED (BLACK OAK HERITAGE PARK AREA, OJIBWAY PARK AREA, TALLGRASS PRAIRIE HERITAGE PARK AREA, OJIBWAY PRAIRIE PROVINCIAL NATURE RESERVE AREA, SPRING GARDEN NATURAL AREA, AND OAKWOOD NATURAL AREA)

A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60% and is also extremely rare in Ontario. Similar to Tallgrass Prairie, there is no minimum size to be considered significant; however, the site must not be dominated by exotic or introduced species (<50% vegetative cover by exotic species). The ELC ecosites that may qualify as rare savannah communities include Dry Tallgrass Savannah (TPS1), Fresh – Moist Tallgrass Savannah (TPS2), Dry Tallgrass Woodland (TPW1), Fresh – Moist Tallgrass Woodland (TPW2) and Cultural Savannah (CUS1). From Appendix N in the SWH Technical Guide, at least five indicator species have also been confirmed present within these communities.

The rare Savannah communities mapped and confirmed as part of this study include:

- Dry Black Oak Tallgrass Savannah Type (TPS1-1; G3/S1)
- Fresh – Moist Pin Oak – Bur Oak Tallgrass Savannah Type (TPS2-1; G1/S1)
- Dry Black Oak – White Oak Tallgrass Woodland Type (TPW1-1; G2/S1)
- Fresh – Moist Black Oak – White Oak Tallgrass Woodland Type (TPW2-1; G2/S1)
- Fresh – Moist Pin Oak Tallgrass Woodland Type (TPW2-2; G1/S1)

One or more of these communities are found in Black Oak Heritage Park Area, Ojibway Park Area, Tallgrass Prairie Heritage Park Area, Ojibway Prairie Provincial Nature Reserve Area, Spring Garden Natural Area, and Oakwood Natural Area.

OTHER RARE VEGETATION COMMUNITIES – CONFIRMED (ALL NATURAL AREAS)

Other provincially rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWH Technical Guide. These include forest (FOD), meadow marsh (MAM) and swamp (SWD) communities. One or more of the following additional rare communities have been identified within all the natural areas:

- Dry – Fresh Black Oak Deciduous Forest Type (FOD1-3; G4/S3)
- Dry – Fresh Oak – Hickory Deciduous Forest Type (FOD2-2; G4/S3S4)
- Fresh – Moist Black Walnut Lowland Deciduous Forest (FODM7-4; G4/S2S3)

- Swamp White Oak Mineral Deciduous Swamp (SWD1-1; G1G2/S2S3)
- Pin Oak Mineral Deciduous Swamp (SWD1-3; G2/S2S3)

WATERFOWL NESTING AREA – CANDIDATE

Waterfowl nesting areas are important to local, resident waterfowl populations. These areas include uplands associated with a variety of wetland habitats, including shallow water features, marshes, meadow marshes, and swamps. Although formal nesting studies have not been completed for the natural areas, breeding evidence has been recorded for two indicator species in the Ojibway Park Area, Tallgrass Prairie Heritage Park Area, and Spring Garden Natural Area in the OBBA. In addition, other indicator species are frequently recorded in these sites in secondary sources. Given the frequency of these observations and the presence of potentially suitable nesting habitat, this SWH is considered candidate in Ojibway Park Area, Tallgrass Prairie Heritage Park Area, and Spring Garden Natural Area.

BALD EAGLE AND OSPREY NESTING, FORAGING AND PERCHING HABITAT – CANDIDATE

According to the SWH Technical Guide for 7E, this SWH criteria includes forest communities (including forested swamps) directly adjacent to riparian areas – rivers, lakes, ponds, and wetlands (MNR, 2015). Nesting Bald Eagle and Osprey have been documented in the City of Windsor and Town of LaSalle. Confirmed nests in the area support the possibility that Bald Eagle or Osprey could use the habitat within the natural areas in the future. Suitable habitat is present for these species in the Ojibway Prairie Provincial Nature Reserve Area.

WOODLAND RAPTOR NESTING HABITAT – CANDIDATE AND CONFIRMED (BLACK OAK HERITAGE PARK AREA, OJIBWAY PARK AREA, OAKWOOD NATURAL AREA, AND SPRING GARDEN NATURAL AREA).

Woodland raptor nesting sites are rarely identified but are sensitive habitats that are often used annually. Nesting habitat may be found in any of the forested ELC ecosites and in deciduous swamps. Several indicator species have been documented in the area in secondary sources. All natural woodland/forest stands >30 ha with >4 ha of interior habitat (interior habitat is defined as a 200 m buffer in this instance) are considered suitable habitat. Intermediate to mature deciduous forest habitat is present for nesting raptors in Black Oak Heritage Park Area, Ojibway Park Area, Tallgrass Prairie Heritage Park Area, Ojibway Prairie Provincial Nature Reserve Area, Spring Garden Natural Area, and South Cameron Woodlot Area. WSP observed large stick nests in the Cultural Woodland in the South Cameron Woodlot Area, in the Black Oak dominated woodland in Ojibway Prairie Provincial Nature Reserve Area, and in the Black Oak dominated deciduous forest in Ojibway Park Area.

TURTLE NESTING HABITAT – CANDIDATE AND CONFIRMED (OJIBWAY PARK AREA AND SPRING GARDEN NATURAL AREA)

These habitats are rare and when identified are often the only breeding site for local populations of turtles. Two indicator species for nesting turtle habitat are quite common in the ponds and shallow marshes in the Ojibway Park Area, Tallgrass Prairie Heritage Park Area, Ojibway Prairie Provincial Nature Reserve Area, Spring Garden Natural Area, and

Malden Park. Preferred nesting sites for turtles include exposed mineral soil (sand or gravel) in open sunny areas, usually within 100 m of wetland habitat.

Although confirmatory studies for nesting turtles have not been completed, the Ojibway Prairie Complex is known to provide well-drained, mineral sandy substrate and a variety of open habitat types in proximity to occupied wetlands. The sandy shoreline of the Detroit River in Ojibway Shores is also identified as suitable nesting habitat for turtles (Gardener-Costa et al., 2017).

Lastly, although municipal and provincial road shoulder and embankments are known to be used by turtles for nesting, these areas were not considered part of the SWH evaluation.

AMPHIBIAN BREEDING HABITAT: WOODLAND – CANDIDATE

These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations. Two indicator species for woodland breeding were documented in the natural areas during anuran call surveys.

SWH habitat for breeding amphibians is defined as the presence of a wetland, pond or woodland pool (including vernal pools) >500 m² within or adjacent (within 120 m) to a woodland (no minimum size). Vernal pools in woodlands, swamps and forests are one of the most common wildlife habitat features encountered in the natural areas. However, to be considered Confirmed SWH, the presence of a breeding population of 2 or more of the indicator frog species with at least 20 individuals (adults or eggs masses), or 2 or more of the indicator frog species with Call Level Codes of 3 must occur. The two indicator species were present together in the Oakwood Natural Area only, with Call Level Codes 1 and 3 respectively.

Although all the natural areas evaluated did contain vernal pool habitat and breeding amphibian populations, this SWH category is considered a Candidate designation due to low indicator species diversity and call levels. Call levels are known to be impacted by weather and could be more abundant in future surveys.

AMPHIBIAN BREEDING HABITAT: WETLAND – CANDIDATE AND CONFIRMED (BLACK OAK HERITAGE PARK AREA, OJIBWAY PARK AREA, TALLGRASS PRAIRIE HERITAGE PARK AREA, SPRING GARDEN NATURAL AREA, AND OAKWOOD NATURAL AREA)

Ponds and other open water and shallow marsh features are also present in the natural areas and are suitable to support amphibian breeding. Typically, these wetland ecosites will be isolated (>120 m) from woodland ecosites; however, larger wetlands containing predominantly aquatic species may be adjacent to woodlands. Wetlands >500 m² (about 25 m diameter) that support high species diversity are significant, as are some of the small or ephemeral habitats that support amphibian breeding.

Five indicator species for wetland breeding habitat were documented during anuran call surveys. At least two of these species were present together in the natural areas during call surveys completed for this report, with exception of Malden Park.

Black Oak Heritage Park Area, Ojibway Park Area, Tallgrass Prairie Heritage Park Area, Spring Garden Natural Area and Oakwood Natural Area all have at least two indicator species present with Call Level Codes of 3 and suitable habitat communities, meeting the criteria for Confirmed SWH in these sites. It is possible other sites could be confirmed in future studies.

WOODLAND AREA-SENSITIVE BIRD BREEDING HABITAT – CANDIDATE

Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area-sensitive interior forest songbirds. Habitats are considered to be typically large, mature (>60 yrs old) forest stands or woodlots >30 ha. Habitat is confirmed where interior forest breeding birds are breeding. Studies must confirm the presence of nesting or breeding pairs of three or more of the indicator species. Two of the indicator species have been documented in the natural areas, although breeding status is not known. Nearly all other indicator species have been documented in secondary source reviews.

The largest, mature forest, woodland and swamp communities present in the natural areas are estimated to be at least 75 yrs old based on the review of historical aerial imagery, specifically portions of Black Oak Heritage Park Area, Ojibway Park Area, Tallgrass Prairie Heritage Park Area, Ojibway Prairie Provincial Nature Reserve Area, Spring Garden Natural Area, and South Cameron Woodlot Area. The mature forest, woodland and swamp communities in these natural areas exceed 30 ha and provide potentially suitable interior habitat for breeding birds.

4.2.7.3 Habitats of Species of Conservation Concern

Habitats of Species of Conservation Concern include plant and wildlife species that are listed as Special Concern (SC) or rare, that are declining, or are featured species. Habitats of Species of Conservation Concern do not include habitats of Endangered or Threatened species, as identified by the ESA, 2007 (MNRF, 2015).

SHRUB / EARLY SUCCESSIONAL BREEDING BIRD HABITAT – CANDIDATE AND CONFIRMED (BLACK OAK HERITAGE PARK AREA)

Shrub land or early successional fields (not Class 1 or 2 agricultural lands; and not being actively used for farming) that are >10 ha in size and have a history of longevity are significant. Generally, in southern Ontario, these are considered Cultural communities (CUT, CUS and CUW) and ‘patches’ of shrub communities that can be complexed into larger habitat. Cultural thicket, savannah, and woodland communities of suitable size or complex occur in Black Oak Heritage Park, Spring Garden Natural Area, Tallgrass Prairie Heritage Park Area, Ojibway Prairie Provincial Nature Reserve Area, and South Cameron Woodlot.

Various common and special concern species have been reported in and around these natural areas through secondary sources. Although breeding evidence of these records is not known, the threshold for confirmed breeding has been recorded in all sites in the Ojibway Prairie Complex, except the Ojibway Park Area and Oakwood Natural Area. One or more of the common species have been recorded in secondary sources in all the natural areas except Malden Park.

In Black Oak Heritage Park Area specifically, confirmed breeding and nest building activities of several indicator species were observed and recorded in the OBBA (2021-2023). Given this recent recorded evidence, shrub/early successional breeding bird habitat is considered confirmed in Black Oak Heritage Park Area.

TERRESTRIAL CRAYFISH – CANDIDATE AND CONFIRMED (OJIBWAY PARK AREA, TALLGRASS PRAIRIE HERITAGE PARK AREA, OJIBWAY PRAIRIE PROVINCIAL NATURE RESERVE AREA, SPRING GARDEN NATURAL AREA, SOUTH CAMERON WOODLOT AREA, AND CHAPPUS NATURAL AREA)

All wet meadows, shallow marshes and swamp communities have the potential for terrestrial crayfish. The presence of one or more terrestrial crayfish or their chimneys (burrows) in the suitable habitat confirms the presence of SWH.

Terrestrial crayfish have been recorded in the Ojibway Prairie Provincial Nature Reserve Area, Spring Garden Natural Area, and South Cameron Woodlot Area. In addition, crayfish chimneys have been observed in Ojibway Park Area, Tallgrass Prairie Heritage Park Area, and Chappus Natural Area. Therefore, this type of SWH is considered confirmed in these sites. All other natural areas also contain fresh-moist meadow and/or swamp communities which may be suitable for terrestrial crayfish.

SPECIAL CONCERN AND RARE WILDLIFE SPECIES – CONFIRMED (ALL NATURAL AREAS)

These species are quite rare or have experienced significant population declines in Ontario and include all SC and provincially rare (S1-S3, SH) plant and animal species. These species are tracked by the NHIC.

Site-specific occurrences of SC and provincially rare species are included in Sections 3.2 (plants) and Section 3.3.3 (wildlife) above, and the broader results of NHIC queries are provided in Appendix B. All natural areas included in this study contain habitat that supports Species of Conservation Concern. Therefore, this SWH is confirmed.

4.2.7.4 Animal Movement Corridors

Animal movement corridors are elongated areas used by wildlife to move from one habitat to another. They are important to ensure genetic diversity in populations, to allow seasonal migration of animals and to allow animals to move throughout their home range from feeding areas to cover areas (MNR, 2015). Where a confirmed or candidate SWH has been identified, animal movement corridors must also be identified.

AMPHIBIAN MOVEMENT CORRIDORS – CANDIDATE

Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations. As Amphibian Breeding Habitat –Wetland is confirmed in several natural areas, corridors connecting breeding habitat to foraging and wintering habitat must also be considered. These movement corridors may be found in all ELC ecosites associated with water. They should consist of native vegetation, with several layers of vegetation, and be unbroken by roads, waterways and waterbodies. Corridors should

have at least 15 m of vegetation on both sides of waterway or be up to 200 m wide of woodland habitat (with gaps <20 m). Undeveloped areas are considered the most significant.

The longest movements made by the indicator amphibians are to and from hibernation sites but these distances vary. As winter approaches, frogs and toads seek out either terrestrial or aquatic sites to hibernate. They may hibernate on land under dead trees, in leaf litter, loose soil or animal burrows, or below the frost line. Some species spend the winter under water, or on or in the bottom sediments. As such, movement corridors required by these species will vary.

Because the amphibian breeding habitat is within larger natural and/or naturalized ELC vegetation communities and within undeveloped areas, movement corridors can be mapped from the breeding habitat in all directions within the undeveloped natural areas (with exception of Malden Park where there is no SWH). Major roadways that bound the natural areas, such as Ojibway Parkway and Highway 401, would be effective impediments to amphibian movements. Those smaller roadway (<20 m in width) such as Malden Road and Matchett Road may not preclude amphibian movements between natural areas, but road mortality may be high during seasonal movements. Further, the presence of natural/naturalized municipal drains, such as Titcombe Drain, Titcombe Road Drain, Turkey Creek/Grand Marais Drain and Basin Drain, which provide connections between natural areas may also be important to facilitate the movement of amphibian species between habitat areas.

All this considered, SWH movement corridors are likely present in those natural areas comprising the larger Ojibway Prairie Complex and adjacent Chappus Natural Area. With construction of the Parkway T5 wildlife ecopassage over Highway 401 between Spring Garden Natural Area and Oakwood Natural Area, Oakwood Natural Area is no longer isolated from the core Ojibway Prairie Complex and thus, should also be considered part of candidate SWH movement corridors. South Cameron Woodlot Area, Malden Park and St. Clair College Prairie and Woods are isolated by major roadways and development.

4.2.8 SUMMARY OF SIGNIFICANT NATURAL HERITAGE FEATURES AND WILDLIFE HABITAT

Table 4-3 below includes a summary of the significant natural heritage features discussed in the sections above and Table 4-4 provides a summary of the confirmed and candidate significant wildlife habitat according to the Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005. Second Edition (MNR, 2010); the Significant Wildlife Habitat Technical Guide (MNRF, 2022); and Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (MNRF, 2015).

Table 4-3: Summary of Significant Natural Heritage Features in the Study Area

Natural Area	Significant Natural Heritage Features				
	Area of Natural and Scientific Interest	Provincially Significant Wetland	Significant Woodland	Known Fish Habitat	Significant Wildlife Habitat
Ojibway Shores	X	X	X	X	X
Black Oak Heritage Park Area	X	X	X	X	X
Ojibway Park Area	X		X		X
Tallgrass Prairie Heritage Park Area	X	X	X		X
Ojibway Prairie Provincial Nature Reserve Area	X	X	X	X	X
Spring Garden Natural Area	X	X	X	X	X
Oakwood Natural Area		X	X		X
South Cameron Woodlot Area		X	X		X
Malden Park		X	X		X
Chappus Natural Area		X	X		X
St. Clair College Prairie and Woods			X		X

Table 4-4: Summary of Significant Wildlife Habitat in the Study Area

Natural Area	Seasonal Concentration Areas				Specialized Habitat for Wildlife								Habitats of Species of Conservation Concern			Animal Movement Corridors
	Raptor Wintering	Bat Maternity Colonies	Turtle Wintering Habitat	Reptile Hibernaculum	Old Growth Forest	Rare Vegetation Communities	Waterfowl Nesting Area	Bald Eagle and Osprey Habitat	Woodland Raptor Nesting	Turtle Nesting Habitat	Amphibian Breeding Habitat – Woodland and/or Wetland	Woodland Area – Sensitive Bird Breeding Habitat	Shrub/Early Successional Bird Breeding Habitat	Terrestrial Crayfish	Special Concern and Rare Wildlife Species	Amphibian Movement Corridors
Ojibway Shores	X	X	X	X		X				X	X			X	X	X
Black Oak Heritage Park Area	X	X	X	X	X	X			X		X	X	X	X	X	X
Ojibway Park Area	X	X	X	X	X	X	X		X	X	X	X		X	X	X
Tallgrass Prairie Heritage Park Area	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X
Ojibway Prairie Provincial Nature Area Reserve	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X
Spring Garden Natural Area	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X
Oakwood Natural Area		X		X		X			X		X			X	X	X
South Cameron Woodlot Area	X	X		X	X	X			X		X	X	X	X	X	
Malden Park		X	X	X		X				X	X			X	X	
Chappus Natural Area		X		X		X					X			X	X	X
St. Clair College Prairie and Woods	X	X		X		X					X			X	X	

Notes: X = Confirmed; X = Candidate

5 POLICY CONTEXT AND ENVIRONMENTAL DESIGNATIONS

The section below provides a summary of the current planning context for the 11 natural areas considered in this study: Ojibway Shores, Black Oak Heritage Park Area, Ojibway Park Area, Tallgrass Prairie Heritage Park Area, Ojibway Prairie Provincial Nature Reserve Area, Spring Garden Natural Area, Oakwood Natural Area, South Cameron Woodlot Area, Malden Park, Chappus Natural Area and St. Clair College Prairie and Woods. The plans, policies and legislation that relate to natural heritage and the protection of natural heritage features are arranged under federal, provincial and municipal sub-headings below. Should work of any kind be proposed within the natural areas, the following legislation and regulations will most likely apply. At this time, given current land ownership considerations, the following federal, provincial, and municipal legislation and policies are applicable.

5.1 FEDERAL LEGISLATION

5.1.1 SPECIES AT RISK ACT, 2002

The Canadian SARA was passed into law in 2002 and was last amended on February 2022. The purpose of the SARA is to prevent wildlife species in Canada from disappearing, to provide for the recovery of wildlife species, and to manage species to prevent further risk to their status. Only species listed as Threatened, Endangered, or Extirpated under Schedule 1 are afforded both individual and habitat protection under SARA. Outside of federal lands, SARA legislation only applies to the following:

Migratory birds (i.e., those species listed under Article I of the Migratory Birds Convention Act, 1994) that also fall under Schedule 1 of SARA. This does not include the species' critical habitat; however, it does include residences of migratory birds which have residence descriptions; and

Aquatic species that fall under Schedule 1 of SARA.

Notably, SARA prohibitions can be applied if provincial legislation or voluntary measures do not adequately protect federally listed species and their residence. Generally, compliance with provincial legislation will also satisfy the requirements under the SARA.

5.1.2 FISHERIES ACT, 1985

The federal Fisheries Act was established in 1985 and was recently amended on 25 November 2013 and 29 October 2019. The *Fisheries Act* provides protection to fish and fish habitats such that:

“No person shall carry on any work, undertaking or activity that results in the harmful alteration, disruption or destruction of fish habitat” (Section 35 (1));” and

“No person shall carry on any work, undertaking or activity that results in the harmful alteration, disruption or destruction of fish habitat” (Section 35 (1)).”

The Fisheries Act defines fish habitat as:

“water frequented by fish and any other areas on which fish depend directly or indirectly to carry out their life processes, including spawning grounds and nursery, rearing, food supply and migration areas” (Section 2 (1)).”

The Fisheries Act requires that any development project avoid harmful alteration, disruption, or destruction of fish habitat (HADD) unless authorized by Fisheries and Oceans Canada (DFO). If mitigation measures cannot be applied, and residual effects will cause HADD, then provisions under the Act may apply (i.e., authorization).

5.1.3 MIGRATORY BIRDS CONVENTION ACT

The Migratory Birds Convention Act, 1994 (MBCA; S.C. 1994, c. 22) was passed in 1917 and updated in 1994, and the last amendment was on 12 December 2017. The MBCA prohibits harming and/or killing most species of birds and/or destroying or collecting their eggs or nests. Protected species are listed under Article I of the MBCA (the MBCA is enforced by Environment and Climate Change Canada). These species are native or naturally occurring in Canada and are species that are known to occur regularly in Canada. Most birds found in the natural areas receive protection under the MBCA, and nearly all of the remaining species receive similar protection under the provincial Fish and Wildlife Conservation Act (FWCA; Section 5.2.2). The MBCA, together with the Migratory Birds Regulations (C.R.C., c. 1035), last amended on 30 July 2022, are federal legislative requirements binding members of the public and all levels of government.

5.2 PROVINCIAL LEGISLATION

5.2.1 ENDANGERED SPECIES ACT, 2007

The Ontario ESA was passed into law in 2007 and came into effect on June 30, 2008, and was last amended on 19 October 2021. If a species is listed under the ESA as Extirpated, Endangered, or Threatened, Section 9 of the ESA prohibits killing, harming, harassing, capturing, taking, possessing, collecting, buying, selling, leasing, trading or offering to buy, sell, lease or trade a member of the species. Similarly, Section 10 of the ESA prohibits the damage or destruction of the habitat of all Endangered and Threatened species. Habitat is broadly characterized within the ESA as an area on which the species depends directly or indirectly, to carry on its life processes, including reproduction, rearing of young, hibernation, migration or feeding. Habitat is specifically defined for some species. Species listed as Special Concern are not afforded protection under Section 9 and 10 of the ESA; however, they are protected under Significant Wildlife Habitat.

Destruction of SAR and their habitats constitutes a contravention of the ESA unless authorized by the MECP. The MECP may authorize damage to habitat or individuals by way of registration or permit.

5.2.2 FISH AND WILDLIFE CONSERVATION ACT

The Fish and Wildlife Conservation Act (FWCA) was passed into law in 1997 and was last amended on 3 June 2021. The FWCA applies to 'fish and wildlife' whereby fish are defined as having the same meaning as in the *Fisheries Act*, and wildlife are defined as "an animal that belongs to a species that is wild by nature and includes game wildlife and specially protected wildlife." Those species considered "specially protected wildlife" include those specially protected amphibians, birds, invertebrates, mammals, and reptiles, as identified within Schedules 6 to 11 under the FWCA. The FWCA is managed by the MNRF. If a provision of the FWCA and a provision of the ESA conflict with respect to an animal, invertebrate, or fish, the provision that gives the most protection prevails.

5.2.3 CONSERVATION AUTHORITIES ACT, 1990

The Conservation Authorities Act (CAA) was established in 1990 and was last amended on 1 October 2021. The CAA authorizes the formation of conservation authorities in Ontario and addresses their roles, responsibilities, and governance in resource management and environmental protection. The purpose of the CAA is:

"to provide for the organization and delivery of programs and services that further the conservation, restoration, development and management of natural resources in watersheds in Ontario."

Section 28 of the CAA describes which regulations may be made by a conservation authority (CA) within its jurisdiction. The CA can prohibit, regulate, or require proponents to seek the authority's permission for development if, in the authority's opinion, the control of flooding, erosion, dynamic beaches or pollution, or the conservation of land may be affected by the development. The CA also regulates water use and alteration of watercourses and wetlands.

Each of Ontario's 36 CA's has its own Section 28 Ontario Regulation (O. Reg.). The core mandate of CA's is to undertake watershed-based programs to protect people and property from flooding and other natural hazards and conserve natural resources for economic, social, and environmental benefits. In the City of Windsor, the CAA is applied via ERCA: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses O. Reg. 158/06.

5.2.4 PLANNING ACT, 1990

The Planning Act is provincial legislation that sets out the ground rules for land use planning in Ontario. Established in 1990, the *Planning Act* was last amended on 14 April 2022. The *Planning Act* describes how land use may be controlled and who may control them. The *Planning Act* also provides the basis for developing provincial plans (e.g., Greenbelt Plan and Niagara Escarpment Plan) and regional and municipal official plans to guide development.

The Provincial Policy Statement (PPS) is also issued under Section 3 of the *Planning Act* by the Ministry of Municipal Affairs and Housing (MMAH). Under the *Planning Act*, the PPS is applicable province-wide and provides overall policy directions on matters of provincial interest related to land use planning and development. Regional plans, municipal official plans, and the PPS work together to establish and protect natural features.

5.2.4.1 Provincial Policy Statement, 2020

The PPS came into effect in 1995 and has been amended several times since - in 1997, 2005, 2014, and most recently in 2019. The latest PPS came into effect on May 1, 2020. The PPS provides policy direction on matters of provincial interest related to land use planning and development (MMAH, 2020). The PPS is comprised of various policies on development and land use patterns, resource protection and management, and public health and safety. The PPS provides policies specific to natural heritage and states that natural features must be protected for the long term.

The following sections of the PPS may be relevant to the NUP initiative in that many of the significant natural heritage features identified below and in PPS are present in the City's natural areas. Section 2 of the PPS provides direction for the wise use and management of resources, including the protection of natural areas and features. Relevant natural heritage policies are in Section 2.1 of the PPS and generally states that the diversity and connectivity of natural heritage (including surface and groundwater features) should be maintained, restored or, where possible, improved. Section 2.2 of the PPS relates more specifically to water resources and supports planning authorities to protect, improve, and restore the quality and quantity of water.

Policy 2.1.4 lists significant natural heritage features where development and site alteration is not permitted in (concerning Ecoregion 7E):

- significant wetlands; and
- significant coastal wetlands.

Policy 2.1.5 lists significant natural heritage features where development and site alteration is not permitted unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions, including (concerning Ecoregion 7E):

- significant woodlands;
- significant valleylands;
- significant wildlife habitat (the *Significant Wildlife Habitat Technical Guide* (MNRF 2022) and Ecoregion schedules were prepared by the MNRF to assist planning authorities and other participants in the land use planning system);
- significant areas of natural and scientific interest; and
- coastal wetlands that are not subject to policy 2.1.4(b).

Policy 2.1.6 states development and site alteration are not permitted in fish habitat except in accordance with provincial and federal requirements.

Policy 2.1.7 states development and site alteration are not permitted in the habitat of endangered species and threatened species, except in accordance with provincial and federal requirements.

Policy 2.1.8 states development and site alteration are not permitted on adjacent lands to the natural heritage features and areas identified in Policies 2.1.4, 2.1.5 and 2.1.6 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions. Adjacent lands for the purposes of policy 2.1.8 are lands contiguous to a specific natural heritage feature or area where it is likely that development or site alteration would have a negative impact on the feature or area. The extent of the adjacent lands may be recommended by the Province or based on municipal approaches which achieve the same objectives.

5.3 MUNICIPAL LEGISLATIVE REQUIREMENTS

5.3.1 CITY OF WINDSOR OFFICIAL PLAN, 2013

The City of Windsor OP provides guidance for the physical development of the municipality over a 20-yr period while taking into consideration important social, economic and environmental matters and goals. This plan is adopted by Council under the provisions of the Ontario Planning Act. Schedule A identifies planning districts and policy areas and their associated policies. The natural areas are within the Malden Planning District and the Ojibway Planning District.

Environmental designations are shown on Schedule B and C and described in Chapter 5: Environment. Schedule B identifies the Greenway System, which recognizes the entirety of, or portion of, Black Oak Heritage Park Area, Ojibway Park Area, Ojibway Prairie Provincial Nature Reserve Area, Tallgrass Prairie Heritage Park Area, Spring Garden Natural Area, Oakwood Natural Area, South Cameron Woodlot Area and Malden Park as “Natural Heritage.” Other portions of Oakwood Natural Area and Malden Park are designated Community and Regional Parks/Open Space, and portions of Tallgrass Prairie Heritage Park Area and South Cameron Woodlot Area are designated Environmental Policy Areas.

Although not shown on mapping in Schedule B, the OP also includes consideration of Candidate Natural Heritage Sites, which apply to portions of Ojibway Shores, Black Oak Heritage Park Area, Ojibway Park Area, Tallgrass Prairie Heritage Park Area, Spring Garden Natural Area, Oakwood Natural Area, South Cameron Woodlot Area, Malden Park, and St. Clair College Prairie and Woods (ERCA 1992 and 2008), that are not otherwise protected under the designation of Natural Heritage or Environmental Policy Area.

As per the OP, the Greenway System is a planned network of the natural environment and recreational elements. Lands identified as Natural Heritage provide for the protection and conservation of Windsor's most environmentally significant and sensitive natural areas. The policies which establish the permitted uses, ancillary uses, evaluation criteria, protection and

conservation of lands designated as Natural Heritage are further described in Chapter 6 Land Use.

There are three objectives for Natural Heritage in the City:

- To protect, conserve and improve Windsor's most environmentally significant and sensitive natural areas.
- To provide opportunities for recreational uses within Natural Heritage areas.
- To link Natural Heritage areas to other components of the Greenway System.

Uses permitted in the Natural Heritage land use designation shall be nature reserves and wildland management, and Council may permit ancillary recreation and leisure activities and facilities. Additionally, any proponent of development adjacent to lands designated as Natural Heritage, which include Environmental Policy Areas A and/or B and Candidate Natural Heritage Sites, may be required to complete an Environmental Evaluation Report or another suitable study in accordance with the procedures of the OP. The OP also states the Municipality will prepare a conservation management plan for municipally owned lands that are designated as Natural Heritage and will encourage other landowners to do the same.

6 REFERENCES

- Bird Studies Canada. (2009 Edition). Marsh Monitoring Program Participant's Handbook for Surveying Amphibians. Bird Studies Canada in cooperation with Environment Canada and the U.S. Environmental Protection Agency. February 2009.
- Cadman, M. D., Sutherland, D. A., Beck, G. G., Lepage, D., & Couturier, A. R. (2007). Atlas of the Breeding Birds of Ontario, 2001-2005. Toronto, xxii + 706 pp: Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature.
- Chapman, L. J., & Putman, D. F. (2007). The Physiography of Southern Ontario; Ontario Geological Survey, Miscellaneous Release- Data 228. Ontario Geological Survey.
- Choquette, J. D., & Valliant, L. (2016). Road Mortality of Reptiles and Other Wildlife at the Ojibway Prairie Complex and Greater Park Ecosystem in Southern Ontario. The Ottawa Field-Naturalists' Club, 64-75.
- City of Windsor. (1996). Spring Garden Complex. Environmental Evaluation Report. City of Windsor, Department of Planning. June 1996.
- City of Windsor. (2001). Armanda/Yawkey Planning Area. Environmental Evaluation Report. Department of Parks and Recreation and Department of Planning, City of Windsor. May 2001.
- COSEWIC. (2015). COSEWIC assessment and status report on the Proud Globelet *Patera pennsylvanica* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 41 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).
- COSEWIC. (2018). COSEWIC Assessment and Status Report on the False-foxglove Sun Moth (*Pyrrhia aurantiago*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 40 pp. ([False-foxglove Sun Moth Pyrrhia aurantiago \(ec.gc.ca\)](http://False-foxglove%20Sun%20Moth%20Pyrrhia%20aurantiago%20(ec.gc.ca))).
- COSEWIC. (2023). COSEWIC Wildlife Species Assessments (Detailed Version), published May 5, 2023. (<https://cosewic.ca/index.php/en/assessment-process/detailed-version-may-2023.html>).
- Dobbyn, J.(S). 1994. Atlas of the Mammals of Ontario. Federation of Ontario Naturalists, Don Mills, Ontario, 120 pp.
- Environment and Climate Change Canada. 2018. Recovery Strategy for the Slender Bush-clover (*Lespedeza virginica*) in Canada. Species at Risk Act Recovery Strategy Series. Environmental and Climate Change Canada, Ottawa. 3 parts, 23 pp. + vi + 26 pp. + 5pp.
- ERCA. (1986). Fur Trade to Farmstead: A History of Renewable Natural Resources in the Essex Region 1750-1900. Compiled by A. P. Pegg. Essex, Ontario. 115 pp.
- ERCA. (1992). City of Windsor Candidate Natural Heritage Site Biological Inventory, Evaluation Report December 1992.
- ERCA. (2008). City of Windsor, Update to the Candidate Natural Heritage Site Inventory. June 2008.

- ERCA. (2010). Big Creek Watershed Plan – Natural Heritage Study. Town of Amherstburg, Ontario. 49 pages + Appendices.
- Gardner-Costa J., D. Lebedyk, T. Preney, C. Sanders, and W. Waldron. (2017). Ojibway Shores Natural Heritage Inventory/Evaluation. Windsor, Ontario. Report prepared for the Windsor Port Authority, 63 pp.
- GeoHub. (2023). Ontario GeoHub: Aquatic Area and Wooded Area. Land Information Ontario.
- Harding, J. H. (1997). Amphibians and Reptiles of the Great Lakes Region. Ann Arbor: The University of Michigan Press.
- Henry, M. (2020). Field Survey for Old Forest / Trees. Accessed at: <http://www.oldgrowth.ca/oldtrees/>
- Humphrey, C. (2017). Recovery Strategy for the Eastern Small-footed Myotis (*Myotis leibii*) in Ontario. Ontario Recovery Strategy Series. Peterborough, Ontario. vii + 76 pp: Prepared for the Ontario Ministry of Natural Resources and Forestry.
- Humphrey, C., & Fotherby, H. (2019). Recovery Strategy for the Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*) and Tri-colored Bat (*Perimyotis subflavus*) in Ontario. Ontario Recovery Strategy Series. Peterborough, Ontario. vii + 35 pp.+ Appendix. Adoption of the Recovery Strategy for the Little Brown Myotis (*Myotis lucifugus*), the Northern Myotis (*Myotis septentrionalis*), and the Tri-colored Bat (*Perimyotis subflavus*) in Canada (Environment and Climate Change Canada: Prepared by the Ministry of the Environment, Conservation and Parks,).
- Kurta, A. (1995). Mammals of the Great Lakes Region Revised Edition. Ann Arbor: The University of Michigan Press.
- Lee, H. (2008). Southern Ontario Ecological Land Classification. Vegetation Type List. Ontario Ministry of Natural Resources, London, Ontario.
- Lee, H., Bakowsky, W., Riley, J., Bowles, J., Puddister, M., Uhlig, P., & McMurray, S. (1998). The Ecological Land Classification for Southern Ontario: First Approximation and Its Application. SCSS Field Guide FG-02.
- LGL Limited and Sage Earth. (2016). Spring Garden Natural Area Restoration Plan. Prepared for the Ministry of Transportation.
- Loehle, C. (1987). Tree life history strategies: the role of defenses. Canadian Journal of Forest Research. Vol. 18: 209-222.
- Lum, N., T. Morris and J. Perez. (1995). Oakwood Woodlot Stewardship Study and Biological Inventory, Environmental Youth Corps, Windsor Board of Education, Windsor Department of Parks and Recreation, 1995.
- MMAH. (2020). Provincial Policy Statement, 2020. Approved by the Lieutenant Governor in Council, Order in Council No. 229/2020.
- MNR. (2010). Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005. Second Edition. Toronto: Queen's Printer for Ontario. 248 pp.
- MNRF. (2014). Significant Wildlife Habitat Mitigation Support Tool.
- MNRF. (2015). Significant Wildlife Habitat Criteria Schedules For Ecoregion 7E.

- MNRF. (2021a). Ojibway Prairie Complex. General Natural Areas Report.
- MNRF. (2021b). Ojibway Prairie Provincial Nature Reserve Life ANSI. General Natural Areas Report.
- MNRF. (2022). Significant Wildlife Habitat Technical Guide. Accessed at: <https://www.ontario.ca/document/significant-wildlife-habitat-technical-guide>
- MTO. (2008). Natural Heritage Impact Assessment - Recommended Plan, Detroit River International Crossing Study. Canada-United States-Ontario-Michigan Border Transportation Partnership.
- NHIC. (2022). Species lists accessed at: <https://www.ontario.ca/page/get-natural-heritage-information>
- Oldham, M. (1983). Environmentally Significant Areas of the Essex Region, A Background Report to the Essex Region Conservation Plan. Essex Region Conservation Authority.
- Ontario Breeding Bird Atlas. (2001). Guide for Participants. Atlas Management Board, Federation of Ontario Naturalists, Don Mills.
- Paiero, S. 2022. The Insect Species from the Ojibway Prairie Complex (Windsor, Ontario, Canada) in the University of Guelph Insect Collection Database, 12 December 2022. Update to current species diversity documented from the complex housed at the University of Guelph Insect Collection. Provided to the Ojibway Nature Centre and Ontario Parks.
- Pratt, P.D. (1979). A Preliminary Life Science Inventory of the Ojibway Prairie Complex and Surrounding Area. City of Windsor, Parks and Recreational Department and Ontario Ministry of Natural Resources, Provincial Parks Branch, Chatham District, Chatham, Ontario. OFER 7913. Unpublished report, 163 pp.
- Pratt, P.D. 1984. Monitoring of Research Plots 1984, Ojibway Prairie Provincial Nature Reserve. The City of Windsor.
- Pratt, P.D. 1985. Monitoring of Research Plots 1985, Ojibway Prairie Provincial Nature Reserve. The City of Windsor.
- Pratt, P.D. 1990. Monitoring of Research Plots 1990, Ojibway Prairie Provincial Nature Reserve. The City of Windsor.
- Pratt, P.D. (1991). Plant Species List for St. Clair College Prairie, November 7, 1991. Ojibway Nature Centre, Windsor, ON.
- Pratt, P.D. 1992. Monitoring of Research Plots 1991, 1992, Ojibway Prairie Provincial Nature Reserve. The City of Windsor.
- Pratt, P.D. 2008. Monitoring of Research Plot E: Mesic Prairie Restoration 2008, Ojibway Prairie Provincial Nature Reserve. The City of Windsor.
- Forest Bird Monitoring Program. 1988-1994. Species list for Black Oak Heritage Park compiled by the City of Windsor, Ojibway Nature Centre (Paul Pratt).
- Putnam, L. J., & Chapman, D. F. (1984). The Physiography of Southern Ontario; Ontario Geological Survey, Special Volume 2; Third Edition. Ontario: Government of Ontario.

- Richards, N. R., Caldwell, A. G., & Morwick, F. F. (1949). Soil Survey of Essex County; Report No. 11 of the Ontario Soil Survey. Guelph: Experimental Farms Service, Dominion Department of Agriculture and the Ontario Agricultural College.
- Rogers, L. (1998). Tallgrass Communities of Southern Ontario, A Recovery Plan. Prepared for the World Wildlife Fund and the Ministry of Natural Resources.
- Sage Earth. (2019). Black Oak Heritage Park Management Plan. Prepared for The Ontario Ministry of Transportation.
- Urban Forest Associated, Inc. (2002). Invasive Exotic Species Ranking for Southern Ontario.
- URS. (2008). Environmental Assessment Report W.O. 04-33-002 Detroit River International Crossing Study, City of Windsor, County of Essex, Town of LaSalle, Town of Tecumseh. Canada-United States-Ontario-Michigan Border Transportation Partnership.
- Wester, M.C., B.L. Henson, W.J. Crins, P.W.C. Uhlig and P.A. Gray. (2018). The Ecosystems of Ontario, Part 2: Ecodistricts. Ontario Ministry of Natural Resources and Forestry, Science and Research Branch, Peterborough, ON. Science and Research Technical Report TR-26.
- Wood. (2021a). Natural Environment Report, Ojibway Parkway Wildlife Crossing. Prepared for the City of Windsor.
- Wood. (2021b). Spring Garden Natural Area Restoration Plan 2017-2021, Restoration and Monitoring Report. Prepared for the Ontario Ministry of Transportation.
- Wyshynski, S and A. Nicolai. 2018. Recovery Strategy for the Proud Globelet (*Patera pennsylvanica*) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ministry of the Environment, Conservation and Parks, Peterborough, Ontario. vi + 32 pp.

Appendix A

Field Survey Species Lists

(Removed to protect sensitive information)

Appendix B

Provincially Rare and Species at Risk Occurrences

(Removed to protect sensitive information)

Appendix C

Bat Activity Figures

(Removed to protect sensitive information)

Appendix D

Significant Wildlife Habitat Screening Document

(Removed to protect sensitive information)

Appendix E

Water Quality and Benthic Invertebrate Assessment

University of Windsor Healthy Headwaters Lab
Water Quality and Benthic Invertebrate Assessments in Ojibway Prairie Complex
2017 - 2021

Healthy Headwaters Lab [The Healthy Headwaters Lab](#)
Great Lakes Institute for Environmental Research
University of Windsor
Traditional Territory of the Three Fires Confederacy
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519-253-3000
healthy.headwaters@uwindsor.ca

In-stream water quality assessments were conducted using a YSI ProDSS handheld probe and a LaMotte 2020we Portable Turbidity Meter was used as an additional measure of turbidity. Other filtered water quality analyses were conducted in the lab and run through the OANL (Organic Analytic and Nutrient Laboratory) services at GLIER which included using a SMARTCHEM (R) 170 Discrete Analyzer and SHIMADZU TOC Analyzer.

Units of measure are as follows:

- uS/cm for Conductivity
- Turbidimeter is NTU
- mg/L for nitrate, ammonia, TN, DOC
- ug/L for TDP

As for the benthic methods, a modified stream assessment protocol was used, following the Provincial protocols, the Ontario Benthic Biomonitoring Network (OBBN), and the Ontario Stream Assessment Protocol (OSAP). Samples were collected from 2 riffles and 1 pool habitat, for 3 samples in total using a 500µm mesh sized D-framed sweep net. Sampling was conducted for 3 minutes for each sampling location. Other stream characteristics included in OBBN and OSAP were also conducted. Samples were preserved in a Formal Ethanol preservative and were stored at room temperature until further processing. Samples were washed using a stack of nested sieves, where the mesh sizes were 4 mm, 1mm, and 0.5mm. Using a stereoscopic microscope, macroinvertebrates were identified to at least the Family level of taxonomic resolution and were stored in 70% ethanol.

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Table 1A: Benthic Invertebrate Sampling Results

Project	Site/ Stream Name	Lab Code	Coordinates	Sampler	Sampling Date	Nematoda	Planariidae	Hydrachnidia	Collembola	Oligochaeta	Erpobdellidae	Sphaeriidae	Lymnaeidae	Physidae	Planorbidae
██████	██████	ER_5289	██████	D-framed net	22-May-17	110	12	0	0	3953	9	1688	48	158	28
██████	██████	GMD-UR-010	42.258850, -83.043158	D-framed net	29-Oct-20	48	83	4	0	4813	5	17	1	29	1
██████	██████	MMD-UF-010	42.257433, -83.045856	D-framed net	28-Oct-20	6	308	5	1	553	3	7	0	3	1
██████	██████	GMD-UR-004	42.258850, -83.043158	D-framed net	15-Apr-21	5	0	0	0	7007	0	3	0	0	0
██████	██████	MMD-UF-004	42.257433, -83.045856	D-framed net	15-Apr-21	17	90	0	1	765	0	5	0	0	0

Table 1B: Benthic Invertebrate Sampling Results

Project	Site/ Stream Name	Lab Code	Coordinates	Sampler	Sampling Date	Cambaridae	Asellidae	Crangonyctidae	Gammaridae	Calopterygidae	Coenagrionidae	Baetidae	Caenidae	Corixidae	Mesoveliidae
██████	██████	ER_5289	██████	D-framed net	22-May-17	0	181	55	6	0	12	0	25	0	0
██████	██████	GMD-UR-010	42.258850, -83.043158	D-framed net	29-Oct-20	1	6	11	5	0	0	4	0	1	2
██████	██████	MMD-UF-010	42.257433, -83.045856	D-framed net	28-Oct-20	0	13	7	0	1	0	0	0	0	0
██████	██████	GMD-UR-004	42.258850, -83.043158	D-framed net	15-Apr-21	0	0	1	0	0	0	0	0	0	0
██████	██████	MMD-UF-004	42.257433, -83.045856	D-framed net	15-Apr-21	0	118	0	1	1	0	0	0	0	0

Table 1C: Benthic Invertebrate Sampling Results

Project	Site/ Stream Name	Lab Code	Coordinates	Sampler	Sampling Date	Hydroptilidae	Hydrophilidae	Dytiscidae	Chironomidae	Ceratopogonidae	Ephydridae	Muscidae	Psychodidae	Pediciidae	Simuliidae
[REDACTED]	[REDACTED]	ER_5289	[REDACTED]	D-framed net	22-May-17	0	0	128	6406	24	17	0	0	0	0
[REDACTED]	[REDACTED]	GMD-UR- 010	42.258850, - 83.043158	D-framed net	29-Oct-20	12	0	2	618	2	15	8	3	0	6
[REDACTED]	[REDACTED]	MMD-UF- 010	42.257433, - 83.045856	D-framed net	28-Oct-20	0	0	0	80	6	14	0	1	1	0
[REDACTED]	[REDACTED]	GMD-UR- 004	42.258850, - 83.043158	D-framed net	15-Apr-21	0	1	0	286	0	1	0	0	0	0
[REDACTED]	[REDACTED]	MMD- UF-004	42.257433, - 83.045856	D-framed net	15-Apr-21	0	0	9	249	12	8	0	0	0	0

Table 1D: Benthic Invertebrate Sampling Results

Project	Site/ Stream Name	Lab Code	Coordinates	Sampler	Sampling Date	Tabanidae	Tipulidae	Crambidae	Thysanoptera
[REDACTED]	[REDACTED]	ER_5289	[REDACTED]	D-framed net	22-May-17	1	38	4	16
[REDACTED]	[REDACTED]	GMD-UR- 010	42.258850, - 83.043158	D-framed net	29-Oct-20	0	0	0	1
[REDACTED]	[REDACTED]	MMD-UF- 010	42.257433, - 83.045856	D-framed net	28-Oct-20	0	2	0	0
[REDACTED]	[REDACTED]	GMD-UR- 004	42.258850, - 83.043158	D-framed net	15-Apr-21	0	0	0	0
[REDACTED]	[REDACTED]	MMD- UF-004	42.257433, - 83.045856	D-framed net	15-Apr-21	0	0	0	0

Table 2A: Water Quality Sampling Results for Marentette Mangin Drain

Site	Date	Latitude	Longitude	WaterTemp	pH	DOmgL	DOpercent	Conductivity	YSITurbidity	Turbidimeter	NitrateNitrite	Ammonia	TN	TDP	DOC
██████	10/28/2020	██████	██████	12.3	7.31	9.24	86.6	1211	7.03	9.17	1.272	0.012	1.294	0	5.154
██████	11/26/2020	██████	██████	9.7	7.55	9.49	83.8	1243	6.01	6.89	1.308	0.019	1.546	0	6.035
██████	12/22/2020	██████	██████	6.8	8.23	10.8	89.2	1828	3.68	5.35	1.896	0.612	1.604	0	6.273
██████	01/22/2021	██████	██████	4.4	7.52	11.67	91	3156	6.89	9.17	1.52	0.442	2.892	0	5.315
██████	02/23/2021	██████	██████	4.2	7.88	11.9	92.2	2862	27.7	51	0.874	0.504	1.689	0.013	6.934
██████	03/17/2021	██████	██████	7.9	7.77	10.66	90.7	3174	6.58	18.3	0.884	0.067	1.063	0.025	5.925
██████	04/15/2021	██████	██████	9.8	7.36	9.66	85.8	2414	6.15	24.7	1.025	0.119	1.549	0.028	6.665
██████	05/20/2021	██████	██████	14	7.06	7.78	76	2249	8.4	17.4	1.328	0.138	1.537	0.04	7.529
██████	06/17/2021	██████	██████	15.1	7.23	7.47	75	2684	17.33	4.15	1.247	0.114	1.447	0.032	5.892
██████	07/02/2021	██████	██████	19.7	7.48	7.11	78.1	1739	12.71	10.27	1.236	0.199	1.577	0.051	6.096
██████	03/17/2021	██████	██████	7.9	7.77	10.66	90.7	3174	6.58	18.3	0.884	0.067	1.063	0.025	5.925
██████	08/26/2021	██████	██████	21.3	7.02	6.02	68.3	1317	29.19	26.8	1.133	0.169	1.395	0.016	3.725
██████	09/06/2021	██████	██████	19.2	7.1	6.74	73.3	1434	7.68	5.51	1.27	0.13	1.669	0.041	5.388
██████	10/06/2021	██████	██████	18.4	7.63	7.4	79.2	1382	8.41	8.66	1.222	0.162	1.478	0.011	5.291
██████	08/26/2021	██████	██████	21.3	7.02	6.02	68.3	1317	29.19	26.8	1.133	0.169	1.395	0.016	3.725

Table 2B: Water Quality Sampling Results for Grand Marais Drain

Site	Date	Latitude	Longitude	WaterTemp	pH	DOmgL	DOpercent	Conductivity	YSITurbidity	Turbidimeter	NitrateNitrite	Ammonia	TN	TDP	DOC
██████████	10/29/2020	██████████	██████████	12.6	8.58	18.77	176.1	1247	5.36	1.82	0.985	0.09	1.271	0.054	5.542
██████████	11/26/2020	██████████	██████████	10.9	7.81	10.02	90.9	762	17.26	24.5	1.051	0.065	1.636	0.013	5.464
██████████	12/22/2020	██████████	██████████	6.7	8.05	12.1	99.8	2497	10.55	13.3	1.086	0.513	1.418	0.018	7.953
██████████	01/22/2021	██████████	██████████	2.5	7.75	14.55	107.7	2905	2.61	4.42	0.961	0.451	1.099	0.101	5.477
██████████	02/23/2021	██████████	██████████	4	7.53	11.98	93.6	6420	56.33	56.7	0.849	0.494	1.952	0.078	7.49
██████████	03/17/2021	██████████	██████████	13.3	9.84	31.63	305	2600	3.2	4.06	0.459	0.006	0.9629	0.026	6.16
██████████	04/15/2021	██████████	██████████	11.6	8.82	22.74	210.2	2118	5.55	6.06	0.649	0.175	1.241	0.094	6.987
██████████	05/20/2021	██████████	██████████	24.2	8.63	17.53	210.1	2187	2.97	2.82	0.672	0.128	1.098	0.085	9.398
██████████	06/17/2021	██████████	██████████	17.3	7.95	10.16	106.4	1962	2.33	4.26	0.573	0.131	1.232	0.175	6.755
██████████	07/02/2021	██████████	██████████	21.6	8.38	13.47	153.5	1511	3.34	3.53	1.034	0.074	1.375	0.107	7.16
██████████	08/26/2021	██████████	██████████	23.9	7.98	9.39	111.5	1355	4.76	3.91	0.778	0.188	1.305	0.146	7.565
██████████	09/06/2021	██████████	██████████	18.8	7.85	8.32	89.7	1153	8.9	7.98	0.728	0.272	1.445	0.155	8.598
██████████	10/06/2021	██████████	██████████	18.6	8.04	10.03	107.6	1283	5.13	3.45	1.36	0.213	1.794	0.114	6.37

Appendix F

Sources for Species Lists and
Species Information for Ojibway
Prairie Complex

Sources for Species Lists and Species Information for Ojibway Prairie Complex

Ojibway Prairie Complex Species Lists and Species Information

Ojibway Nature Centre maintains and collects species lists and species information for Ojibway Prairie Complex. Ojibway Nature Centre, 5200 Matchett Road, Windsor, Ontario, N9C 4E8, 519-966-5852, ojibway@citywindsor.ca www.ojibway.ca

The Insect Species from the Ojibway Prairie Complex (Windsor, Ontario, Canada) in the University of Guelph Insect Collection Database Date: 12 December 2022

This list documents the current insect species diversity documented from Ojibway Prairie Complex with specimens housed at the University of Guelph Insect Collection.

<https://bpb-ca-c1.wpmucdn.com/sites.uoguelph.ca/dist/e/34/files/2023/01/Ojibway-Prairie-complex-species-list-DEC-2022-DEBU-.pdf>

2014 Ojibway Prairie Complex Bioblitz with Essex County Nature

A BioBlitz is a 24 hour species cataloguing event. In 2014, the Essex County Field Naturalists' set out to promote conservation, increase public awareness, compile species records and generate interest in Ojibway Prairie Complex by conducting a Bioblitz. Thirty experts and approximately 100 participants set out into the Ojibway Prairie Complex on June 28-29, 2014 to document all flora and fauna they encountered: [2014 Ojibway Prairie Complex BioBlitz – June 28-29 – Essex County Nature](#)

Citizen Science

Nature counts includes the Ontario Breeding Bird Atlas and contains data on distribution and abundance of Canadian species, gathered by a network of volunteers and scientists in dozens of partnership programs. The NatureCounts platform allows users to collect, interpret and access data on wildlife in Canada. [NatureCounts - NatureCounts](#)

The Natural Heritage Information Centre manages data about the location of species of conservation concern, plant communities, wildlife concentration areas, and natural areas in Ontario. Observations related to these elements can be reported to the Centre. The centre assigns conservation status ranks to species, plant communities and wildlife concentration areas in Ontario. These ranks are then used by the province, national organizations and international organizations to help assign legal statuses and other conservation designations. These designations are made at the provincial, national and global scale. [Natural Heritage Information Centre | ontario.ca](#)

Ebird is a project of the Cornell Lab of Ornithology. EBird data document bird distribution, abundance, habitat use, and trends through checklist data provided by bird observers. [eBird - Discover a new world of birding...](#)

iNaturalist Canada is led by the Canadian Wildlife Federation (CWF) along with Parks Canada, NatureServe Canada and the Royal Ontario Museum (ROM). iNaturalist is an online social network of people sharing biodiversity information to help each other learn about nature. [A Community for Naturalists · iNaturalist Canada](#)

Sources for Species Lists and Species Information for Ojibway Prairie Complex

Species at Risk Recovery Strategies

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) is an independent advisory panel to the Minister of Environment and Climate Change Canada that meets twice a year to assess the status of wildlife species at risk of extinction.

<https://cosewic.ca/index.php/en/status-reports.html>

The Committee on the Status of Species at Risk in Ontario (COSSARO) is an independent committee providing advice to the Minister of the Environment, Conservation and Parks on the subject of which plants and animals should be listed as at risk.

<https://cossaroagency.ca/species/>