Kettle Creek Golf Course, Port Stanley

Environmental Impact Study

Prepared for:

James Glover
Strathroy Turf Farms Ltd.
6297 Olde Drive
Appin, ON
N0L 1A0

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NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Kettle Creek Golf Course, Port Stanley

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Project Team

Nyssa Hardie	Ecohydrologist, Project Advisor
Jeremy Bannon	Terrestrial & Wetland Biologist, Certified Arborist, Project Manager
Kaitlin Filippov	GIS Specialist
Eve Krauss	Aquatic Biologist
Emma Glinny	Terrestrial & Wetland Biologist

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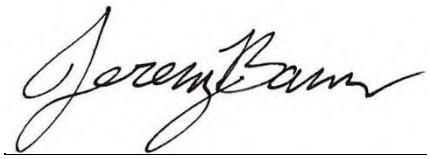

Jeremy Bannon B.E.S. P. Biol.

Project Manager

Terrestrial and Wetland Biologist, Certified Arborist

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1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained by James Glover to complete an Environmental Impact Study (EIS) in support of a proposed subdivision development at 320 Carlow Road, Port Stanley, Ontario, herein referred to as the subject property (Map 1). This report was first submitted on October 31, 2024 and has been revised with the updated site plan provided by Monteith Brown Planning Consultants (MBPC), dated February 6, 2025.

The property is currently an active golf course known as the Kettle Creek Golf and Country Club, and is located within the Municipality of Central Elgin, and the County of Elgin.

The subject property is approximately 30ha in size, and is generally bound by Carlow Road to the east, a proposed subdivision to the north, an active subdivision development to the south, and agricultural lands and woodlands to the west. The surrounding landscape is predominantly agricultural, with several adjoining woodlands, wetlands, and watercourses. There are two permanent watercourses, one ephemeral watercourse, and one anthropogenically maintained pond, while Kettle Creek flows to the east of the subject property, beyond Carlow Road. Natural hazard lands (river flood hazards and flood fringe) were also identified within the subject property by municipal and conservation authority mapping. The subject property is largely comprised of maintained lawn and isolated hedgerows, however wooded features within the property include small cultural plantations, cultural woodland, and deciduous forest (Map 2).

The Municipality of Central Elgin Official Plan (CEOP) (2023) requires the submission of an EIS for the purpose of providing the details of a background information review, description of the policy context, and to assess potential impacts of the proposed development. This EIS was prepared in accordance with the Elgin County Official Plan (ECOP 2015) and the CEOP for the proposed undertaking of a subdivision development, as seen in the Proposed Development Concept (Appendix I). Past and present guidance provided by the Kettle Creek Conservation Authority (KCCA) and the Ontario Ministry of Natural Resources (OMNR), Aylmer District was also considered throughout the duration of the study.

This EIS provides information on the field surveys undertaken in 2022 and 2023, a detailed analyses of Species at Risk (SAR) habitat, Significant Wildlife Habitat (SWH), identification of any natural feature constraints in association with land use policy designations, and the assessment of potential impacts and mitigation measures associated with details of the site alteration.

For the purposes of this report, the term “subject property” refers to the lands owned by the proponent including the area where the undertaking is proposed to occur. The term “study area” refers to the subject property and the surrounding area (approximately 120m, plus any contiguous natural features) for which additional information was collected and reviewed (as could be gathered without direct access to these areas). The subject property boundary and surrounding study area is illustrated on Map 1. The term “development area” refers to the location where construction will be required to facilitate the proposed development. This will include grading activities that may extend past the final developed footprint. This proposed area has been determined through iterative, multidisciplinary reviews and discussions within the project team. Legacy data collected from agencies and wildlife atlases encompassed an area of approximately 1km around the property to ensure that all surrounding natural features were considered.

1.1 Proposed Undertaking

The proposed residential and recreational development consists of single-detached homes, public streets, parkland, and open space, as well as a redesigned 9-hole golf course as seen in Appendix I. The proposed development area is restricted to the manicured lawns and hedgerows of the existing golf course.

The existing pond will be converted into a functional stormwater management (SWM) pond for the proposed residences and woodlands within the subject property will be preserved and protected.

1.2 Project Scoping

The need for an EIS was identified due to the presence of natural heritage features within the subject property as mapped in the ECOP and CEOP. NRSI collected background information, including compiling species lists, and identified key natural heritage features within the study area in order to determine required wildlife and vegetation surveys. For a detailed discussion of background information and relevant policies, please see the Terms of Reference in Appendix II.

A preliminary screening exercise was conducted for all documented SAR and Species of Conservation Concern (SCC) from the property to identify whether suitable habitat is present within the study area. The results of this screening, updated since submission within the TOR, are presented in the SAR Screening Table in Appendix III. The initial species lists and SAR screening were used to guide the scope and type of wildlife surveys required, and to ensure that

the potential presence of all SAR and SCC were adequately addressed in this EIS. SAR are those listed on the Species at Risk in Ontario List (MECP 2023). These include species identified by the Committee on the Status of Species at Risk in Ontario (COSSARO) as provincially Endangered, Threatened, or Special Concern. Species listed as Endangered or Threatened are protected by the Endangered Species Act, 2007, which includes protection to their habitat; these species are referred to as 'regulated SAR' in this report.

Species considered Special Concern are included in the definition of Species of Conservation Concern (SCC), which includes the following:

1. Species designated provincially as Special Concern,
2. Species that have been assigned a conservation status (S-Rank) of S1 to S3 or SH by the Natural Heritage Information Centre, and
3. Species that are designated federally as Threatened or Endangered by the Committee for the Status of Endangered Wildlife in Canada (COSEWIC) but not provincially by the COSSARO. These species are protected by the federal Species at Risk Act but not provincially by the Endangered Species Act.

Full results of the SAR and SCC screening exercise are provided in Appendix III.

A preliminary screening for the presence of SWH was also completed for the study area as part of the background review, and can be found in Appendix IV. Candidate SWH types were assessed in the field and are discussed in detail below.

2.0 Relevant Policies, Legislation and Planning Studies

For the purposes of this EIS, information on the natural heritage features within the subject area was collected and assessed for significance. To help inform and identify areas to be protected, these features are evaluated against the following relevant policies, legislation, and planning studies. The specific implications of these policies to the proposed development are discussed further below. Table 1 provides a summary of these documents.

Table 1. Relevant Policies, Legislation, and Planning Studies

Policy/Legislation	Description	Project Relevance
Provincial Planning Statement (OMMAH 2024)	• Issued under the authority of Section 3 of the Planning Act and came into effect on October 20, 2024, replacing the 2020 PPS (OMMAH 2020). • Section 2.1 of the PPS – Natural Heritage establishes clear direction on the adoption of an ecosystem approach and the protection of resources that have been identified as 'significant'. This section also identifies that natural features are to be protected for the long term. • The Natural Heritage Reference Manual (OMNR 2010) and the Significant Wildlife Habitat Technical Guide (OMNR 2000) were prepared by the MNRF to provide guidance on identifying natural features and in interpreting the Natural Heritage sections of the PPS.	• Several natural features were identified within the study area as having potential implications under the PPS, including: o Fish Habitat; o Significant Wildlife Habitat; and o Habitat for Endangered and Threatened Species. • Areas of Natural and Scientific Interest (ANSI) are also identified to occur just beyond the study area boundary. This Earth Science ANSI is described as the Port Stanley Till. • The PPS indicates that development or site alteration shall not be permitted within these features unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.
Endangered Species Act, 2007 (Government of Ontario 2007)	• The original ESA, written in 1971, underwent a year-long review which resulted in a number of changes which came into force in 2007. • The ESA prohibits killing, harming, harassing, or capturing Endangered or Threatened and protects their habitats from damage and destruction.	• Several regulated SAR and/ or their habitat were identified as having the potential to occur within the study area based on presence of suitable habitat.
Species at Risk Act (SARA) Government of Canada 2002)	• SARA establishes the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as an independent body of experts responsible for assessing and identifying species at risk.	• Any observed species that are listed on Schedule 1 of SARA as endangered or threatened shall be protected, along with their habitat. The EIS shall

Policy/Legislation	Description	Project Relevance
	• The SARA creates prohibitions to protect listed threatened and endangered species and their critical habitat.	demonstrate that no impacts to SAR will occur.
Migratory Birds Convention Act (MBCA) (Government of Canada 1994)	• Prohibits the disturbance, destruction, or taking of a nest or eggs of migratory birds.	• The timing of construction activities, especially vegetation clearing and site grading must have consideration for the MBCA timing windows.
Fish and Wildlife Conservation Act (FWCA) (Government of Ontario 2019)	• The act provides protection for certain bird species not covered by the MBCA including raptors, as well as furbearing mammals, their dens, and habitual dwellings.	• The timing of construction activities, especially vegetation clearing and site grading must have consideration for bird nesting and den sites for fur-bearing mammals.
Fisheries Act, 1985 (Government of Canada 1985)	• Proposed amendments to the Fisheries Act were introduced in 2018 to restore lost protections and incorporate modern safeguards. On August 28, 2019, the new, "modernized" Fisheries Act came into force and includes new protections for fish and fish habitat in the form of standards, codes of practice, and guidelines for projects near water. • The modernized Act provides protection for all fish and fish habitat and prohibits the harmful alteration, disruption or destruction of fish habitat. • The DFO Canada's Fish and Fish Habitat Protection Program ensures compliance with relevant provisions under both the Fisheries Act and the Species at Risk Act. The program reviews proposed works, undertaking and activities that may impact fish and fish habitat. • Works that are proposed in and around certain types of waterbodies may not require DFO review. Likewise, if proponents can follow all specified measures to protect fish and fish habitat outlined by DFO, review may not be necessary.	• The municipal drains on and adjacent to the subject property provide direct fish habitat. • The need for project review by the Department of Fisheries and Oceans (DFO) Fish and Fish Habitat Protection Program (FFHPP) will be determined upon the completion of a proponent-led assessment of whether the proposed undertaking can meet all measures to protect fish and fish habitat (as outlined in the DFO's online Projects Near Water guidelines). • Should the proponent-led assessment indicate that impacts to fish and fish habitat may occur as a result of the proposed development, project review by the DFO will be necessary to determine if the proposed undertaking has the potential to contravene the Fisheries Act, and if an Authorization under the Act will be required. • Crossing locations over watercourses will need to consider the Fisheries Act.

Policy/Legislation	Description	Project Relevance
Ontario Drainage Act (Government of Ontario 2021)	• The Act provides legislation and policies for the creation, maintenance, and repair of municipal drains in Ontario. • DFO's drain classification system includes 7 categories that help to simplify the review and approval process for municipal drain works.	• The constructed municipal drains within the subject property, the Lake Road Drain and Marr Drain 1991, are not rated by the DFO. • The Marr Drain originates to the northeast of the subject property and will not be altered for the proposed development. The existing concept plan may involve the construction of a secondary access road in proximity to the unclassified drain, which occurs near the existing driveway for the Kettle Creek Golf and Country Club.
Conservation Authorities Act 41/24 (2024)	• Regulation issued under *Conservation Authorities Act,* R.S.O. 1990, Ontario Regulation 97/04. This regulation prohibits certain development activities directly in the legislation. • This regulation replaces Regulation 150/06 following the establishment of the Conservation Authorities Act.	• The Act provides regulatory power to Conservation Authorities to review and approve or deny development applications "in areas that are within the authority's area of jurisdiction and are […] wetlands, river or stream valleys among other areas." Development within the Kettle Creek Conservation Authority (KCCA) regulation areas shall be reviewed by the KCCA and may require a permit.
Prohibited Activities, Exemptions and Permits Ontario Regulation 41/24 (Government of Ontario 2024)	• Guidelines for regulating activities in natural and hazardous areas (i.e., areas in and near rivers, streams, floodplains, wetlands, and slopes). The document outlines permitted uses and alterations within these regulated areas, as well as policies for management.	• The KCCA regulates a portion of the subject property due to the presence of wetlands and watercourses. Permitting from the KCCA shall be obtained for proposed works if within their regulation areas.
The Official Plan of the County of Elgin (2015)	• The ECOP provides direction for the land use planning in the County and identifies objectives and policies for the Natural Heritage System (NHS), water resources, and natural hazards. • The Plan provides direction on the preparation of EISs for the County.	• Specific policies for the protection of Significant Woodlands and Areas of Natural and Scientific Interest are provided in the ECOP and are applicable to the woodlands and ANSI within the study area. • This EIS has been prepared in accordance with the ECOP policies.

Policy/Legislation	Description	Project Relevance
Municipality of Central Elgin Official Plan (2023)	• The CEOP includes specific policies for the protection of natural features within the municipality, as well as area specific policies for each town and hamlet in its authority. • Area specific policies for Port Stanley are covered under Schedule G. • Guidance for the preparation of Environmental Impact Studies are provided in the CEOP. • The Plan requires that a Species at Risk (SAR) screening is prepared for lands under consideration for development. Specific guidance is provided in the CEOP. • An EIS is required to identify impacts to natural features and provide mitigation measures where impacts are anticipated to occur. • The EIS should also include and Environmental Management Plan (EMP) that discusses natural feature protection and enhancement.	• This EIS has been prepared in accordance with the CEOP (2023) and the EIS Guidelines in Appendix B of the CEOP.
Elgin County Woodlands Conservation By-Law No. 05-03 (County of Elgin 2005)	• The Elgin County Woodlands Conservation By-law came into effect in 2001, and outlines policies for the protection and proper management of trees and woodlands in the County. • The by-law states that no person, through their own actions or through any other person's actions, shall harvest, destroy, or injure any living tree unless the person who is harvesting, destroying, or injuring trees has done so in accordance with Good Forestry practices and within the Circumference Limit.	• The subject property includes areas of sloped woodland. As such, any tree removal on or near the sloped areas may require a permit from Elgin County under by-law 05-03.

3.0 Field Methods

The type and scope of study methods was determined based on the SAR screening, SWH screening, background review, and historical EIS work completed within the general vicinity, and is detailed in the Terms of Reference and Issues Scoping Report (Appendix II). Table 2 provides details on all site visits including survey type and date, protocols applied, length of each survey, weather conditions, and participating biologists.

Table 2. Field Survey Summary

Survey Type	Protocol	Date (2023*)	Start and End Time (24 hrs)	Air Temp. (°C)	Wind Speed (Beaufort Scale)	Cloud Cover (%)	Precipitation	Observers
Fall Vegetation Survey	Lee et al. (1998)	Oct 18, 2022	9:30-13:15	4	3	100	Light Rain	C. Humphrey; T. Sieg
Bat Habitat Assessment	MNRF (2014) MNRF (2017)	March 23	09:45-12:30	8	0	100	Rain	M. Beck; S. Howe
Anuran Call Survey	BSC (2009)	April 4	20:45-21:18	13	2	0-50	None	M. Beck; E. Bannon
		May 9	21:07-21:37	10-12	2	10	None	K. Hoo; J. Richard
		June 15	21:36-22:17	17-18	1-2	100	None	H. Manoharan
Aquatic Habitat Assessment (Spring)	Stanfield 2017 (modified)	May 3	09:15-17:13	5-7	2-4	85-100	None – Light Rain	J. Néné; N. Grant
Fish Community Assessment	Stanfield 2017 (modified)							
Spring Vegetation and ELC Delineation	Lee et al. (1998)	May 19	10:22-14:00	18	2	30	None	S. DeWeerd; K. Croutch
Turtle Basking Survey	(MNRF 2015b)	May 19	13:45-15:30	22	4	30	None	S. DeWeerd; K. Croutch
		May 24	12:00-13:00	23	2	50	None	D. Pomezanski; M. Douglas
		June 8	10:45-11:05	18	3	50	None	K. Hoo; D. Skinner
		June 19	10:10-10:30	21	3	5	None	K. Hoo; J. Richard

Survey Type	Protocol	Date (2023*)	Start and End Time (24 hrs)	Air Temp. (°C)	Wind Speed (Beaufort Scale)	Cloud Cover (%)	Precipitation	Observers
Breeding Bird Survey	OBBA (2001)	June 8	06:50-08:50	12	3	90	None	K. Hoo; D. Skinner
Butterfly and Insect Survey	N/A	June 8	09:00-11:15	15-18	2	50	None	K. Hoo; D. Skinner
Breeding Bird Survey	OBBA (2001)	June 19	07:20-08:56	14	2	0	None	K. Hoo; J. Richard
Butterfly and Insect Survey	N/A		08:15-10:35	16	3	0	None	K. Hoo; J. Richard
Summer Vegetation Survey	Lee et al. (1998)	August 2	11:00 – 14:00	23	3	55	None	S. DeWeerd; K. Croutch
Aquatic Habitat Assessment (Summer)	Stanfield 2017 (modified)	August 22	09:41-14:20	23-26	1-3	60-80	None	E. Krauss, O. Holbrook

*All surveys were completed in 2023 unless otherwise indicated.

Field surveys were undertaken within the study area to characterize natural features, identify significant and sensitive natural heritage features, and collect information on species that have the potential to be adversely affected. A variety of field surveys were undertaken, which are described in detail below. Surveys conducted were undertaken in accordance with provincial and local protocols and guidance documents as indicated below.

3.1 Vegetation Surveys

Vegetation communities within the study area were mapped and classified following the Ecological Land Classification (ELC) system for Southern Ontario (Lee et al. 1998) during site visits on October 22, 2022, May 19, 2023, and August 2, 2023. Details on the vegetation communities were recorded including species composition, uncommon species or features, and evidence of human impacts.

A three-season vegetation inventory (spring, fall and summer) was conducted in tandem with ELC efforts to record all species of vascular flora within the subject property. Inventories within the broader study area were completed from the edges of the subject property or road allowances.

3.2 Breeding Bird Surveys

Breeding bird surveys were completed using a combination of point counts and area search, consistent with the Ontario Breeding Bird Atlas protocol (OBBA 2021a, OBBA 2021b). Surveys consisted of 10-minute point counts at six pre-determined locations throughout the subject property as well as area searches completed by ELC polygon. Breeding bird surveys took place in the early morning beginning no earlier than 30 minutes prior to sunrise and extending to four hours after sunrise. All surveys were completed under appropriate weather conditions, low wind (Beaufort 0-3) and little to no precipitation. All birds observed, as well as the highest level of breeding evidence exhibited for each species, were recorded by an avian biologist.

Incidental observations of avian species during other site visits were also recorded.

3.3 Bat Habitat Surveys

The Ontario Ministry of Natural Resources (OMNR) has recently revised guidelines for the identification of suitable bat roosting habitat as per the *Recovery Strategy for the Little Brown Myotis (Myotis lucifugus), Northern Myotis (Myotis septentrionalis) and Tri-colored Bat (Perimyotis subflavus) in Ontario* (Humphrey and Fotherby 2019), the *Species at Risk Bat Survey Standard Note* (MECP 2022a), and the *Bats and Treed Habitats – Maternity Roost Surveys* (MECP 2022b) distributed by the Ontario Ministry of Conservation and Parks (MECP). Given the presence of woodlands adjacent to the proposed development footprint, bat habitat assessments were conducted to determine the presence of bat roosting habitats based on the MECP protocols.

Identification of suitable maternity roosts within forests/woodlands and isolated trees includes examining every tree ≥10cm DBH in the field for signs of loose bark, cracks and/or cavities that would provide suitable roosting habitat for Little Brown Myotis (*Myotis lucifugus*) and Northern Myotis (*Myotis septentrionalis*). All trees ≥10cm DBH with loose exfoliating bark, or suitable cracks and crevices are to be considered suitable roosting habitat for these species (MECP 2022a). Habitat for Tri-colored Bat (*Perimyotis subflavus*) includes dead foliage on live trees (e. g., along a broken branch), particularly oak and maple species, dogwood leaves, accumulations of pine needles, squirrel nests, and cavities (Humphrey and Fotherby 2019).

Surveys for suitable bat roosting habitat were conducted in the woodlands and for isolated trees within the subject property on March 23, 2023.

3.4 Turtle Basking Surveys

MNRF has published turtle basking survey protocols for Blanding's Turtle as per the *Survey Protocol for Blanding's Turtle (Emydoidea blandingii) in* Ontario (MNRF 2015). The surveys served to identify potential overwintering and summer habitats and confirm species presence on the property. A total of four turtle basking surveys were completed in 2023 on May 19, May 24, June 8, and June 19. Surveys were conducted at two locations within the subject property including the large central pond and the meadow marsh (MAS2) community.

3.5 Aquatic Habitat Assessment

Aquatic habitat assessments were completed on May 3, 2023 and August 22, 2023. NRSI biologists completed aquatic habitat characterizations on the Lake Road Drain, the Marr Drain 1991, the ephemeral watercourse, and the pond within the subject property (Map 3). The surveys followed a modified version of the standard Ontario Stream Assessment Protocol (OSAP) methodology (Stanfield 2017). The following information was recorded during the surveys:

- Adjacent land cover characteristics (e.g., land use, canopy, riparian habitat),
- Channel morphology (e.g., bankfull and wetted widths, bank height, planform),
- Substrate type and composition,
- Available habitat and fish cover,
- General flow conditions (e.g., water depths, riffle/run/pool features),
- In-situ water quality parameters (water temperature, conductivity, dissolved oxygen, etc.), and,
- Critical life stage areas for fish (e.g., spawning, nursery habitat, etc.).

3.6 Fish Community Assessment

Fish community sampling was conducted on May 3, 2023 utilizing a Smith Root electrofishing backpack (Model LR-20B), dip nets, baited minnow traps, and an aerated holding tank. NRSI staff utilized a single-pass screening survey methodology, starting at the downstream extent of the watercourses and moving upstream against the flow. Sampling targeted different habitat types (riffles, runs, and pools) within the watercourses to fully assess the fish community present. Minnow traps were baited and set within the pond and left to soak for seven hours. Minnow traps were not set within the other watercourses on-site, as the depths were unsuitable to support this sampling methodology. All native fish collected were identified, enumerated, and

live-released shortly after capture, while invasive species were euthanized and buried above the high-water mark as directed by the Ministry of Natural Resources.

3.7 Additional Wildlife

All observations of mammals, birds, odonates, lepidoptera, and herpetofauna were documented on all field visits. This included actual direct observations of individuals, as well as signs of wildlife presence (i. e. tracks, scats, dens, nests etc.). As part of on-site SWH and SAR screenings, biologists searched in particular for evidence of badger, particularly suitable dens.

4.0 Existing Conditions

4.1 Soil, Terrain and Drainage

The glacial history of the Port Stanley area includes the advancement and retreat of the Lake Erie ice lobe, which covered the current Lake Erie shoreline. As the Wisconsian glacier receded, several glacial lakes occupied the area around Port Stanley and St. Thomas. These lakes left large deposits of fine sediments within the County of Elgin (Chapman and Putnam 1984). The local terrain and landforms are dominated by Kettle Creek and its historic valley. The municipal drains within the subject property are tributaries of Kettle Creek, which flows adjacent to the east of the subject property beyond Carlow Road. Sands and silts in this region were deposited as a delta in glacial Lake Whittlesey and Lake Warren, with varying levels of drainage and generally porous soil, throughout the Norfolk Sand Plains area. With a thin layer of organic matter on the top stratum of the ground, erosion is quite common for the area (Chapman and Putnam 1984).

Over time, Kettle Creek has formed a deep valley with steep sides and a flat valley floor (Chapman and Putnam 1984). The steep slope within the western extent of the subject property is a remnant of the historic Kettle Creek valley wall, while the eastern extent of the subject property is located within the historic valley floor. Soil types within the subject property are classified as Valley Complex, a soil type associated with U-shaped valleys with nearly level flood plains and valley wall slopes greater than 15% (Schut 1992). The material texture is variable, and natural drainage capabilities range from rapid to poor (Schut 1992).

4.2 Vegetation

4.2.1 Vegetation Communities

The majority of the subject property is characterized by an active golf course, with maintained lawn and anthropogenically influenced hedgerows. Two small cultural plantations are found on the subject property, bordering larger deciduous forest and cultural woodland communities that extend into the study area. Preliminary mapping of these vegetation communities can be found on Map 2 and ELC communities are described below in detail.

Dry-Fresh Sugar Maple-Beech Deciduous Forest Type (FOD5-2)

The canopy and subcanopy of these deciduous forests are dominated by Sugar Maple (*Acer saccharum*) and American Beech *(Fagus grandifolia*), with lesser amounts of Shagbark Hickory (*Carya ovata*) and Black Cherry (*Prunus serotina*). Eastern Hop-hornbeam (*Ostrya virginiana*) is also present in the sub-canopy. Common shrubs include Multiflora Rose (*Rosa multiflora*) and Red Raspberry (*Rubus idaeus*). In the understorey layer, there is significant regeneration of White Ash (*Fraxinus americana*) and Green Ash (*Fraxinus pennsylvanica*). The ground layer consists of invasive Garlic Mustard (*Alliaria petiolata*), Blue-Stemmed goldenrod (*Solidago caesia*), and Dame's Rocket (*Hesperis matronalis*). These communities are mature and have steep, variable topography associated with the western boundary of the subject property.

Fresh-Moist Lowland Deciduous Forest Type (FOD7)

The canopy of this deciduous forest is dominated by Black Walnut (*Juglans nigra*) with Sugar Maple also present. The sub-canopy includes young regenerating White Ash and invasive Common Buckthorn (*Rhamnus cathartica*). The understorey layer is relatively disturbed, comprising Common Buckthorn and Privet (*Ligustrum vulgare*). The groundcover includes Calico Aster (*Symphyotrichum lateriflorum*) and a variety of common grasses. In the canopy, many dead Ash (*Fraxinus* spp.) trees remain standing. This community is located in the southern extent of the study area and in the northwestern corner of the subject property.

Mineral Shallow Marsh Ecosite (MAS2)

A small shallow marsh is present near the northeastern corner of the subject property within the Marr Drain 1991. The canopy of this community is comprised of sparse Crack Willow (*Salix euxina*), while the sub-canopy contains Sandbar Willow (*Salix interior*), and Manitoba Maple (*Acer negundo*). In the understorey, dense Phragmites (*Phragmites australis*) dominates some

portions, with other areas of Reed Canary Grass (*Phalaris arundinacea*), though Canada Goldenrod (*Solidago canadensis*), and cattail (*Typha* spp.) are also present. The groundcover layer includes Colt's foot (*Tussilago farfara*), Panicled Aster (*Symphyotrichum lanceolatum*), and Spotted Jewelweed (*Impatiens capensis*).

Deciduous Swamp (SWD)

The community to the east of the MAS2 community is comprised of deciduous swamp species. The canopy of this feature is comprised of both Black Walnut and Willow species (*Salix spp.)*. In the understorey, Red Raspberry (*Rubus idaeus*) and Red-osier Dogwood (*Cornus sericea*) are present. The groundcover composition of this community is dominated by Skunk Cabbage (*Symplocarpus foetidus*) with occasional Spotted Jewelweed.

Submerged Shallow Aquatic Ecosite (SAS1)

This waterbody occurs within the FOD5-2 community in the study area. Aerial photo interpretation indicates that some submergent aquatic vegetation and a duckweed species (*Lemna* spp.) are present within this feature.

Open Aquatic (OA)

An unvegetated constructed pond is present within the centre of the golf course. The pond appears to have little to no submergent or floating vegetation. The shoreline of this feature has been anthropogenically lined with cobble and is unsuitable for plant growth.

Mineral Cultural Woodland Type (CUW1)

In this cultural woodland, the canopy is predominantly Black Walnut and Ash, the latter of which are largely dead or declining due to Emerald Ash Borer (*Agrilus planiplennis*) infestation. The sub-canopy includes White Ash, Bitternut Hickory (*Carya cordiformis*), and Virginia Creeper (*Parthenocissus quinquefolia*). In the understorey layer, Canada Goldenrod (*Solidago canadensis*), Multiflora Rose (*Rosa multiflora*), and Guelder Rose (*Viburnum opulus*) are present. The groundcover layer consists of Orchard Grass (*Dactylis glomerata*), Garlic Mustard, and Large-leaved Avens (*Geum macrophyllum*).

White Pine Coniferous Plantation Type (CUP3-2)

Eastern White Pine (*Pinus strobus*) is the dominant species in the various plantation communities on the subject property. The canopy also includes lesser amounts of American Elm (*Ulmus americana*), Common Pear (*Pyrus communis*), and Eastern Cottonwood (*Populus deltoides*). In the sub-canopy, Common Buckthorn, Black Cherry, and Riverbank Grape (*Vitis riparia*) are found. Shrubs include Pale Dogwood (*Cornus amomum*), Guelder Rose (*Viburnum opulus*) and Privet. There is also considerable growth of Canada Goldenrod in the understorey. The groundcover consists mostly of Garlic Mustard, Poison Ivy (*Toxicodendron radicans*), Calico Aster, and Creeping Charlie (*Glechoma hederacea*). These plantations comprise a large portion of the wooded features on the subject property.

Dry-Moist Old Field Meadow Type (CUM1-1)

The cultural meadow has a sparse canopy of Eastern Cottonwood. The sub-canopy consists of Black Willow (*Salix nigra*), Common Buckthorn, Eastern Cottonwood, and White Spruce (*Picea glauca*). In the understorey, meadow species such as Tall Goldenrod (*Solidago gigantea*), Grass-leaved Goldenrod (*Euthamia graminifolia*), Reed Canary Grass, and Staghorn Sumac (*Rhus typhina*) are present. In addition to these species, Virginia Creeper is also abundant in the groundcover layer. This community is situated along the banks of the Lake Road Drain near the southeastern extent of the subject property.

Raspberry Cultural Thicket Type (CUT1-5)

A small, narrow raspberry thicket community is found within the deciduous forest at the western extent of the subject property. It is dominated by Red Raspberry and has sparse to no canopy or subcanopy.

Mineral Cultural Thicket Ecosite (CUT1)

There are three small cultural thicket communities present within the study area. These communities contain coniferous tree species such as White Pine, White Spruce, Norway Spruce (*Picea abies*), and White Cedar (*Thuja occidentalis*). The groundcover plants consist of Garlic Mustard, Common Burdock (*Arctium minus*), Kentucky Bluegrass (*Poa pratensis*), and Stinging Nettle (*Urtica dioica*).

4.2.2 Vascular Flora

Detailed vegetation inventories were conducted during site visits and 172 species were identified. Background information from the NHIC database indicates that 11 rare plant species are reported from within 1km of the Study area. These species are SAR, SCC, or considered significant in the County of Elgin. The SAR screening (Appendix II) identifies that suitable habitat for three of these species may be present within the study area: Butternut (*Juglans cinerea*), American Ginseng (*Panax quinquefolius*), and Broad Beech Fern (*Phegopteris hexagonoptera*), however no SAR plant species were reported within the subject property during vegetation inventories or tree inventories.

A list of all vascular plant species observed as well as their current status ranks, are available in Appendix V.

4.3 Birds

A total of 107 bird species are reported from the vicinity of the study area based on the OBBA (BSC et al. 2008). The data found in the OBBA includes those species that have been observed in the area (10 x 10km range), are reported to nest in the area, and/or have exhibited some evidence of breeding in the area. 45 bird species were recorded during breeding bird surveys on the subject property in 2023. The highest diversity of species was observed at station BMB-04, positioned at the northwestern corner of the subject property. Five SAR or SCC bird species were observed within the study area, including Red-headed Woodpecker (*Melanerpes erythrocephalus*), Bank Swallow (*Riparia riparia*), Barn Swallow (*Hirundo rustica*), Wood Thrush (*Hylocichla mustelina*), and Eastern Wood-pewee (*Contopus virens*).

Refer to Appendix VI for a list of bird species reported from and observed within the study area, and their current status ranks.

<u>Red-headed Woodpecker</u>

Red-headed Woodpecker is a regulated SAR, listed provincially (MECP 2023) and federally (Government of Canada 2023) as Endangered. On August 22, 2023, a single individual was observed south of the subject property, within the broader study area. No breeding evidence for this species was recorded, however there is suitable habitat for this species present in the protected woodland features.

Bank Swallow

Bank Swallow is a regulated SAR, listed provincially (MECP 2023) and federally (Government of Canada 2023) as Threatened. On June 8, 2023, ten individuals were observed foraging over a wet area in the agricultural field to the north of the subject property. On June 19, 2023, 15 individuals were observed foraging at the same location. Breeding evidence was not observed in either instance, and there is no suitable nesting habitat present within the subject property.

Barn Swallow

Barn Swallow is a SCC, listed provincially (MECP 2023) and federally (Government of Canada 2023) as Special Concern. A total of eight Barn Swallows were observed within the subject property during breeding bird surveys. Due to the presence of suitable nesting habitat within the subject property, it is Probable ('PR') that Barn Swallow are nesting within the study area. No nests were observed on the subject property, however, including any anthropogenic structures.

Wood Thrush

Wood Thrush is a SCC, listed provincially (MECP 2023) as Special Concern and federally (Government of Canada 2023) as Threatened. On June 8, 2023, a single individual was observed with Possible ('PO') breeding evidence within the FOD7 community to the north of the subject property.

Eastern Wood-pewee

Eastern Wood-pewee is a SCC listed provincially (MECP 2023) and federally (Government of Canada 2023) as Special Concern. Multiple Eastern Wood-pewee were reported from within the subject property and broader study area during field investigations and breeding bird surveys. Breeding evidence for this species was recorded as Probable ('PR') due to the presence of suitable permanent habitat as they were observed in the same general location during both breeding bird surveys.

4.4 Mammals

According to the Mammal Atlas of Ontario (Dobbyn 1994), 45 mammal species are reported from within 10km of the Study area. Eight mammal species were observed by NRSI during the field investigations in 2022 and 2023.

Appendix VIII provides a complete list of mammal species reported from and observed within the study area as well as their current status ranks.

A bat habitat assessment was conducted on March 23, 2023 for trees that met characteristics for roosting bat habitat as described in the Methods Section 3.3 of this report. Four cavity trees and three loose bark trees were recorded within the subject property.

During the on-site SWH assessment, NRSI biologists searched for suitable dens and burrows for American Badger (*Taxidea taxus*). No suitable dens or burrows were observed on the subject property or adjacent lands.

4.5 Lepidoptera and Odonata

According to the Ontario Butterfly Atlas (Macnaughton et al. 2023), 48 butterfly species are reported to occur within the study area. NRSI biologists observed nine species during surveys completed on the subject property in 2023.

The Ontario Odonata Atlas (OOAD 2023) reported 31 odonate species that have been observed within the atlas square which includes the study area. Biologists observed four common species during the insect surveys in 2023 conducted within the subject property.

A complete list of species observed is provided in Appendix X.

4.6 Aquatic Features

4.6.1 Aquatic Habitat Assessment

There are two permanent drains (Marr Drain 1991 (Marr Drain) and Lake Road Drain), an ephemeral watercourse, and a pond present within the subject property (Map 3). Marr Drain 1991 originates to the northeast of the subject property and flows south along the eastern property boundary until the laneway, where it meanders east and drains into Kettle Creek to the east of Carlow Road. Lake Road Drain originates southwest of the subject property and flows east along the southern boundary of the subject property before bending north towards its confluence with the Marr Drain 1991. The confluence of the Marr Drain and the Lake Road Drain occurs on the north side of the laneway to the subject property. Both drains are unrated, open drains identified by the Department of Fisheries and Oceans (DFO) (DFO Identifier 95913) (2017).

In-situ water quality parameters were measured during both spring and summer site visits, and are provided in Table 3. These measurements included air and water temperature, dissolved oxygen (D.O, mg/L and %), total dissolved solids (TDS, ppt and mg/L), pH and conductivity (milliSiemens(mS) and microSiemens (µS/cm)).

Table 3. Water Quality Measurements

Location	Date and Time (hrs)	Air Temp. (°C)	Water Temp. (°C)	D.O (mg/L)	TDS (ppt)	pH	Conductivity (mS)
Marr Drain 1991	May 3, 2023 @ 1303	6	11.3	11.58	0.03	7.77	0.05
Lake Road Drain	May 3, 2023 @ 1112	6	8.4	12.23	0.02	7.98	0.03
Ephemeral Watercourse	May 3, 2023 @ 0930	5	7.5	6.61	0.03	7.9	0.05
Pond	May 3, 2023 @ 1025	5	10.7	5.97	0.03	7.97	0.05
Location	**Date and Time (hrs)**	**Air Temp. (°C)**	**Water Temp. (°C)**	**D.O (mg/L and %)**	**TDS (mg/L)**	**pH**	**Conductivity (µS/cm)**
Marr Drain 1991	August 22, 2023 @ 0941	23	17	7.4 78.6%	31	6.2	0.43
Lake Road Drain	August 22, 2023 @ 1215	26	20.3	9.07 99.7%	24	7.28	0.34
Pond	August 22, 2023 @ 1125	26	23.4	7.33 86.9%	7	7.4	0.54

Marr Drain 1991

Marr Drain originates north of the subject property and flows generally south along the eastern property boundary until its confluence with Lake Road Drain at the southeastern boundary of the subject property (Map 3). Throughout the subject property, Marr Drain has a low gradient and is relatively straight, except for a large bend in the channel at the northern property boundary.

The slope of the adjacent valley lands is low (less than 5°). The riparian zone was 0 – 10 m wide and was densely vegetated with trees, shrubs, and herbaceous plant species. The canopy was dominated by deciduous trees providing a moderate to high amount of shade. Marr Drain was documented to be the widest at the upstream end, where water entered from what appeared to be a headwater drainage feature within the agricultural field north of the subject property into a large, shallow pool. The culvert between the agricultural field and the subject property was 50cm in diameter. The headwater drainage feature north of the subject property was not assessed due to limited access to adjacent properties.

Bankfull width ranged from 1.6 – 7.4 m. Throughout both assessments, the bank height ranged from 0.1 – 0.75 m, with a stability rating of moderate due to the high density of vegetation and small areas of undercut banks. During the spring assessment (May 3, 2023) the wetted width of the channel ranged from 1.3 – 3.27 m. In contrast, during the low-flow summer assessment (August 22, 2023), the wetted width of the channel ranged from 1.3 – 1.8 m. The substrates throughout Marr Drain are composed primarily of clay, with large amounts of overlying sand and smaller aggregations of silt, pebble, gravel, and cobble.

Fish habitat is present throughout Marr Drain, characterized by in-stream cover and refuge within runs, riffles and pools, woody debris, undercut banks, cobble, and limited instream vegetation. The limited in-stream vegetation within the Marr Drain was characterized by emergent grass species.

Lake Road Drain

Lake Road Drain is a generally straight channel with a low gradient. The adjacent valley lands are characterized by a low (less than 5**°)**. The riparian zone extended 0 – 10 m from the watercourse, characterized by dense herbaceous plants and shrubs and occasional deciduous trees. The canopy was largely open, with low quality and limited shading afforded to the creek. The bankfull width ranged from 1.7 – 4.3 m. Bank height throughout the drain ranged from 0.0 – 0.75 m high, with moderate stability due to the high-density vegetation. Evidence of erosion was observed in various locations in the form of undercut banks. The wetted width of the channel ranged from 1.2 – 2.2 m during the spring assessment, and from 0.7 – 1 m during the low-flow summer assessment. The substrates throughout the channel were composed primarily of clay and silt, with large aggregations of overlying sand and smaller quantities of gravel, pebble, and cobble.

There are two laneway crossings with culverts throughout the length of the reach, one occurs beneath the subject property laneway entering the site in the east, and the second occurs at the cart path crossing between the parking lot and the hole to the southeast. The downstream culvert, located under the subject property laneway off Carlow Road, is a 95 cm diameter corrugated steel pipe (CSP) perched 40cm above the water. This culvert likely acts as a barrier to fish passage from the Marr Drain to the Lake Road Drain, unless in considerable high-flow conditions. A 29 cm diameter outlet of a tile drain was also observed entering from the west bank adjacent to the subject property laneway. The upstream side of this culvert contained a

large buildup of garbage and debris. The second culvert, located further upstream beneath the cart path crossing from the parking lot to hole southeast of the lot, is an 84 cm diameter CSP.

Lake Road Drain (Off Property Reach)

A visual assessment of the off-property reach of Lake Road Drain was completed on August 22, 2023. After the 90° bend at the southern property boundary, Lake Road Drain narrows and runs parallel to the property line at a low gradient. The adjacent valley slope was moderate (5 - 15°) characterized by a riparian zone extending 0 – 10 m from the watercourse and vegetated with herbaceous ground cover plants. Due to the lack of trees present on this reach, there was no canopy cover and no shade.

The substrates throughout the channel were consistent with the reach assessed on-site, with large amounts of overlying sand and areas of built-up cobble.

Ephemeral Watercourse

The unnamed, ephemeral watercourse present in the southwest corner of the subject property meanders slightly with a low gradient throughout its length. The adjacent valley lands were steep (greater than 15°) and characterized by Dry-Fresh Sugar Maple -Beech Deciduous Forest (FOD5-2). The riparian zone extended 0 – 10 m from the watercourse and was sparsely vegetated with Skunk Cabbage and grasses (Carex sp.). The adjacent deciduous forest provides large amounts of high-quality shade. The bankfull width ranged from 1.5 – 2.3 m, and was consistent throughout the reach. The bank was less than 0.3 m high, with moderate stability due to the low density of vegetation present. The wetted width of the watercourse ranged from 0.23 – 0.67 m, and substrates were dominated by silt with detritus, and clay present in smaller quantities.

The channel was absent of riffles and runs and comprised largely of step pools. The ephemeral watercourse is essentially functioning as a headwater drainage feature (HDF). During the spring assessment, there was very little water present within the feature and almost negligible flow. During the summer assessment, there was only standing water present at the downstream extent off of the subject property. There was an oily sheen present in some of the pools of standing water and abundant Skunk Cabbage at the downstream extent, indicating that groundwater discharge may be present.

4.6.2 Fish Community Assessment

A review of background information sources (Department of Fisheries and Oceans (DFO) SAR mapping (2023), and Aquatic Area Resource Data (AARA) (2023) revealed no information regarding fish species present within the drains and other aquatic features present on-site. A total of 12 fish species were captured within the aquatic features in the subject property during the May 3, 2023 fish community assessment. There was one invasive species captured (Goldfish (Carassius auratus)), the other eleven species were all common, native species.

A total of ten fish species were captured within the Marr Drain during the fish community assessment. Of these species, nine were native and one was invasive (Goldfish). Five of the species captured within the Marr Drain are identified to be warmwater species, while the other five are coolwater species. A total of four fish species were captured within the Lake Road Drain. All four species are coolwater fish and are native to Ontario. Finally, two species were captured within the golf course pond. Both species have a warmwater thermal regime and are native to Ontario.

A complete list of the fish observed and captured is provided in Appendix IX.

5.0 Significance and Sensitivity of Natural Features

5.1 Woodlands

As shown in Schedule A2 of the CEOP (2023) and Appendix #1 of the ECOP (2015), significant woodlands are shown to occur within the subject property. As indicated in the CEOP (2023), "…*for the purposes of this Plan all woodlands greater than 2 hectares in size are considered significant*."

In Section D1.2.2.1 of the ECOP (2015), "*Elgin County considers woodlands 10 hectares or greater as significant woodland. Woodlands between 2 hectares and 10 hectares are also significant if they are located within 30 metres of the boundary of a significant natural heritage feature (e.g. significant wetland, significant valleyland, fish habitat and/ or watercourses).*"

All woodland features identified in the subject property extend into the study area in contiguous parcels greater than 10ha in size, and thus may be considered significant under the CEOP (2023) and ECOP (2015). Under the ECOP (2015), site alteration is not permitted within these woodland features unless it is demonstrated by an EIS that there will be no negative impacts on the feature or its ecological function. The ECOP (2015) also states that development and site alteration should not be permitted in any adjacent lands (defined as 120m from the boundary of the significant woodland), unless it is demonstrated through an EIS that there will be no negative impacts on these lands or their ecological function.

5.2 Natural Hazard Land

Schedule G2 of the CEOP (2023) identifies Natural Hazards within the Community of Port Stanley. This mapping indicates that the riverine flood hazard limit and flood fringe for Kettle Creek is located within the subject property. Flooding hazards also occur along the length of the municipal drain that runs through the subject property. Schedule G of the CEOP (2023) shows natural hazards mapped within woodlands along the western half of the subject property, and towards the southeastern-most extent. These hazards are expected to be associated with steep slopes found within the significant woodlands.

5.3 Watercourses

Marr Drain 1991 is a permanent watercourse that originates from north of the subject property. The Drain flows south along the eastern boundary of the site until it veers east and converges with Kettle Creek approximately 300m from the subject property. Kettle Creek drains into Lake

Erie 1.5km south of the Marr Drain 1991 outlet. Marr Drain 1991 provides year-round direct fish habitat for a variety of coolwater to warmwater fish species.

The Lake Road Drain is a permanent watercourse which originates to the southwest of the subject property within a wooded area and flows northeast towards its confluence with the Marr Drain 1991, in the subject property. Within the woodland where the Lake Road Drain originates, several other small tributaries and drainage features converge and discharge to the drain. The Lake Road Drain provides year-round direct fish habitat for a variety of coolwater fish species.

Direct fish habitat is protected under the federal *Fisheries Act*, which prohibits the harmful alteration, disruption, and destruction (HADD) to fish and fish habitat. Fish habitat is also afforded protection under provincial and local legislation, including the *Planning Act* per the PPS (2024), the Central Elgin OP (2022) and the Elgin County OP (2015). These watercourses are also regulated by the Kettle Creek Conservation Authority according to Ontario Regulation 41/24 (Government of Ontario 2024). Pursuant to Section 2(1) of of O.Reg 41/24, development or site alteration is prohibited within the watercourse and 15m from stable top of bank, unless subject to approval by the KCCA. This includes straightening, changing, diverting, or interfering with any existing watercourse.

5.4 Significant Wildlife Habitat

Based on the results of a comprehensive background information review, desktop analysis, and field studies, several SWH types were found to be candidate or confirmed habitat within the study area according to the *Significant Wildlife Habitat Criteria Schedules For Ecoregion 7E* (SWH Criteria Schedule; MNRF 2015a). The candidate and confirmed habitats are discussed in detail in the following sections.

5.4.1 Seasonal Concentration Areas

Bat Maternity Colonies - Candidate

A bat habitat assessment was completed for isolated and hedgerow trees within the subject property. Suitable roosting habitat may be present within the deciduous forests (FOD5-2 and FOD7), however detailed assessments were not completed within these communities as no impacts to these communities will occur as a result of the proposed development. During bat habitat assessments, six trees with potentially suitable loose bark and/or cavities were recorded within the subject property (Map 4). This relatively low number is expected to be a result of

continued upkeep and maintenance of planted golf course flora. Removal of any trees with suitable bat habitat will require consultation with MNRF Aylmer District, and potentially SAR specific acoustic monitoring. Many of the documented trees were declining or dead, and so the assessment should be done again at the next design stage to eliminate any trees which may have failed or are no longer suitable, and to identify any further suitable trees. The forested communities within the subject property remain candidate SWH for Bat Maternity Colonies. Tree removal for the purposes of the proposed development will not be required within FOD communities with the subject property, so candidate SWH for bat maternity colonies is not expected to be impacted.

***Turtle Wintering Area* - Candidate**

On May 24, 2023, three Snapping Turtles (*Chelydra serpentina*) and one turtle of an unidentified species were observed basking in the marsh (MAS2) community, located in the northeast corner of the subject property along the Marr Drain (Map 2). Based on the SWH Criteria Schedule (MNRF 2015a), MAS2 is treated as candidate Turtle Wintering Area SWH for the purposes of this report due to these observations. It is unknown whether the community could provide suitable substrates and depth to confirm the habitat type, but the habitat will be protected in entirety.

***Landbird Migratory Stopover Areas* - Candidate**

Breeding bird surveys were completed on June 8 and 19, 2023. Suitable landbird migratory stopover habitat may be present within the forested communities (FOD5-2 and FOD7) based on their size (>5ha) and proximity to Lake Erie (<5km). Forested communities of suitable size within the subject property and study area are considered candidate SWH for landbird migratory stopover areas, however detailed surveys aimed at confirming the specific numbers of birds during migration season were not completed as the candidate habitat will remain protected in its entirety.

5.4.2 Habitat for Species of Conservation Concern

***Special Concern and Rare Wildlife Species* - Confirmed**

Legacy data from NHIC and wildlife atlases identified 51 species at risk with element occurrences within a 1 or 10km grid overlapping the study area. Candidate habitat for Tufted Titmouse (*Baeolophus bicolor*), Canada Warbler (*Cardellina canadensis*), Wood Thrush (*Hylocichla* mustelina), Bald Eagle (*Haliaeetus* leucocephalus), Eastern Wood-pewee, Barn Swallow, Purple Martin (*Progne subis*), Monarch, and Snapping Turtle exist within the subject

property. Several species were observed within the subject property and study area by NRSI biologists during field investigations. Habitat for these species is generally confined to the protected wetland and woodland features. For a complete list of the SCC species observed within the study area, and species with suitable habitat, see Appendix III.

5.4.3 Animal Movement Corridors

***Amphibian Movement Corridors* - Possible**

Anuran call surveys did not detect any of the species listed for significant amphibian movement corridors. A Green Frog (*Lithobates clamitans*) was observed incidentally in the SE corner of the subject property on June 19, 2023. Small unmapped breeding pools may be present within the forest communities that help facilitate amphibian movement. These pools, as well as vegetated watercourse riparian areas, remain possible SWH for amphibian movement corridors.

5.5 Habitat of Endangered and Threatened Species

Two regulated SAR bird species, Red-headed Woodpecker (Endangered) and Bank Swallow (Threatened) were observed by NRSI biologists within the study area. Red-headed Woodpecker was observed south of the subject property and would be limited to the protected forest features within the study area. Bank Swallow was observed in the agricultural area to the north of the subject property and does not have suitable nesting habitat within the subject property.

Bats may use the forested areas on the subject property as well, but this was not confirmed. Bat habitat assessments were completed for isolated trees within the subject property and suitable habitat was observed within six trees. As suitable tree habitat has the potential to change from year to year, an updated assessment should be completed at the next design stage. Correspondence with MECP may be required.

6.0 Impact Analysis

6.1 Proposed Undertaking

As shown in Appendix I, the subject property is proposed to be converted into a large, residential subdivision. These residences will include single detached houses, roadways, parkland, and open space. The existing large, central pond will be kept for use as a stormwater management pond.

6.2 Approach to Impact Analysis

Potential impacts arising from the proposed undertaking were determined by comparing the details of the proposed development (received from MBPC, dated February 6, 2025) with the characteristics of the existing natural features and their functions. Where the development proposal overlaps with or is in close proximity to the natural features, impacts may arise. The boundaries of significant natural features and their associated recommended buffers were provided to the study team to guide the development proposal. This information was combined with other physical and planning constraints to come up with a suitable development plan for the property that respects the natural environment.

Below is a layout of the following analysis:

- **Buffers, Restoration, and Enhancements** are introduced first as they inform each section of the impact analysis. This section provides an overview of the proposed buffer strategy and enhancement plan, which is discussed in further detail as they relate to pertinent impacts.
- **Direct impacts** to the natural features on the subject property associated with disruption or displacement caused by the actual proposed 'footprint' of the undertaking.
- **Indirect impacts** associated with changes in site conditions such as drainage and water quantity/quality.
- **Induced impacts** associated with impacts after the development is constructed such as subsequent demand on the resources created by increased habitation/use of the area and vicinity.

6.3 Buffers, Restoration, and Enhancements

Buffers are a component of the mitigation measures discussed below, and provide protection to natural features and wildlife habitat, and their associated functions, from potential impacts as a

result of development and/or site alteration. Properly functioning buffers can protect natural features against sedimentation and erosion, provide attenuation of precipitation and run-off, protect against human disturbances, serve as habitat transition zones, and contribute to the protection of the natural feature through, for example, maintaining microclimate conditions and limiting the spread of invasive species into the sensitive natural feature.

Woodlands on the subject property provide significant ecological functions, including some possible, candidate, and confirmed SWH and potential SAR habitat. Wooded Areas, as defined by The Municipality of Central Elgin Official Plan (2023), are present within the subject property. According to the CEOP, a significant woodland is any woodland greater than 2ha in size. The CEOP requires setbacks from significant woodlands. All significant woodlands within the subject property will be afforded a 10m buffer.

A minimum 10m buffer from the woodland, and 15m from watercourses and wetlands should be implemented to mitigate impacts from proposed development. Typically, the purpose of this buffer is to:

1) Protect the roots of adjacent trees and vegetation,
2) Mitigate disturbance to forest wildlife, and
3) Provide a buffer area from invasive species disturbance and residents.

The woodland buffer should be naturalized with native species reported from the surrounding area, to enhance and protect the feature. This planting should occur in tandem with an invasive species management plan. This buffer area should be planted with an annual cover crop, suitable herbaceous plugs and/or native seed, shrubs and trees. A detailed planting plan outlining any seed mixes, species, and their placement will need to be developed at a later design stage.

One cultural plantation community (CUP3-2) and young regenerating forest community (simply labelled as FOD in its infancy) contain an existing driveway into the golf course lands within their buffer. The edge of this existing driveway can be seen on Map 4, and at a finer scale in the TPP (Appendix XII). In order to effectively access the site, and to provide suitable protection to these vegetation features, it is proposed that the future drive into the subject property be limited to the extent of existing hardscaping. The development team worked iteratively and collaboratively to ensure that no hardscaping or grading will be required passed the existing

point of hardscaping to eliminate the potential for negative impacts to the natural features south of the drive. No tree removal within these features is required.

The CEOP (2023) mandates that trees may only be removed if they directly impede the construction of buildings and services, and that those removed shall be compensated through replacement in sufficient amounts and maturity. A planting plan for all buffer areas should be developed for the site at a later design stage. These buffers inform an ultimate limit of development which will assist in minimizing adverse impacts to natural features by reducing edge effects and providing opportunities for restoration and enhancement.

Buffers to wetlands and watercourses are required to protect the form and function of these features and the species that inhabit them. The CEOP or ECOP does not mandate a specific setback for non-significant wetlands, therefore, a standard 15m buffer around the northeast wetland communities will be applied. A buffer will not apply to the central golf course pond, as it is an artificial waterbody and is proposed to be redesigned. The CEOP mandates that setbacks from fish habitat are required. A 15m buffer has been applied to all watercourses within the subject property.

6.4 Direct Impacts and Mitigations

The location of natural features and evaluation of their ecological function should be the basis for any development layout. The approach to identifying and delineating the natural features and associated buffers was aimed at avoiding direct impacts from development on important natural features. The following section outlines potential direct impacts of development, and include:

- Tree and Vegetation Removal;
- Site Grading; and
- Impacts to Wildlife and their Habitats.

6.4.1 Tree and Vegetation Removal

The County of Elgin Woodlands Conservation By-Law dictates that “no person through their own actions or through any other person shall harvest, destroy, or injure any living tree” in accordance with specific forestry and circumference limit classifications. A proposed development on the subject property would fall under the exemptions identified in Section 3 d) of the By-Law, which states that the By-Law does not apply to “The injuring or destruction of

trees imposed as a condition to the approval of site plan, a plan of subdivision or a consent under section 41, 51, or 53, respectively, of the Planning Act or as a requirement of a Site Plan agreement or subdivision agreement entered into under those sections".

The proposed development requires the removal of trees, primarily throughout the existing golf course feature. This would include the removal of many isolated trees within the golf course and the complete removal of the northernmost White Pine Coniferous Plantation (CUP3-2) and the east-central hedgerow communities within the subject property. This vegetation removal has the potential to impact wildlife and their habitat.

Trees proposed for removal can be seen in the Tree Protection Plan (Appendix VII). This finding is based on the anticipated limit of disturbance required to facilitate the proposed preliminary residential development plans, and should be updated at a later design stage when detailed grading is available.

The remaining vegetation communities within the subject property and study area will be protected and buffers will be applied (Map 4). It is expected that with the recommended buffers, the overall linkage of natural features and habitats within the broader landscape will be maintained. Minor injury to tree limbs or their root systems from machinery and construction activities (e.g., grading, excavation, etc.) may occur during development. This may entail the compaction of soil or direct injury of the tree. Trees will require suitable tree protection measures before and during construction.

Mitigation, Protection, and Enhancement

No vegetation removal will be permitted within the protected natural areas, such as woodlands, wetlands, and watercourses, as ensured through applicable buffers. A woodland buffer of 10m will mitigate against edge effects, human disturbance (including noise abatement and dumping of waste), and the encroachment of invasive and non-native species into the woodland features. Only where hardscaping already exists in the form of the driveway entrance, will the proposed plan not include a 10m buffer. In this area, damage to existing trees will be mitigated by ensuring all construction is limited to the existing hardscaping edge. The MAS2 wetland and all watercourses within the subject property will have a 15m buffer applied, which is adequate for the attenuation of sediment and stormwater inputs, maintenance of moisture regimes, and protection of sensitive aquatic wildlife. These collective buffers will protect vegetation

communities and support the maintenance of large, cohesive ecological corridors surrounding the subject property.

A TPP has been prepared for the proposed development that identifies avoidance, mitigation, and protection measures for trees on the subject property. This includes the identification of trees that may be impacted by the developments and trees that may be retained. A compensation plan will be required to facilitate these removals, which recommends suitable replacement for trees to be removed, (Appendix VII).

To reduce likelihood of tree injury, Tree Protection Fencing (TPF) is to be installed where trees are adjacent to the limit of disturbance. In order to protect root systems of trees, TPF should generally be installed at least 1m beyond the dripline of trees to be retained, where possible. Grading activities associated with the development should occur beyond this buffer. The TPF should be inspected be a Certified Arborist before any construction activity to ensure no damage to tree limbs or roots. In the event that damage to retained trees occurs during construction, limbs and roots are to be pruned using proper arboricultural techniques.

6.4.2 Site Grading

Due to the rolling topography throughout the site, major grading changes will be required to facilitate the development plan. Site grading has the potential to cut or compress roots, change hydrological flow patterns, and remove wildlife habitat. Improper grading also risks sedimentation and deposition into natural water features.

Mitigation, Protection, and Enhancement

Grading activities will not occur within the areas outlined in the proposed buffer strategy, as described in section 6.3. Revegetation of the minimum vegetation zones is proposed post-construction, which will stabilize the exposed soil, eliminate ploughing damage, and increase wildlife habitat. Combined TPF and erosion and sediment control (ESC) fencing erected around retained trees prior to construction will preserve tree roots from damage during grading activities. An erosion and sediment control plan will be required.

6.4.3 Impacts to Wildlife and their Habitats

According to Environment Canada's Canadian Wildlife Service (CWS), the breeding period for migratory birds that nest in forested habitat in the Lower Great Lakes / St. Lawrence Plain (Area 13) in Ontario is between April 5 and August 26 (CWS 2023a). The Migratory Birds Convention Act (MBCA 1994) protects migratory birds, their eggs, and nests from being harmed or

destroyed. During this period, CWS recommends that no vegetation clearing occurs (CWS 2023b). Any planting plans should be designed to incorporate species that provide forage and nectaring opportunities for wildlife, including meadow openings among tree and shrub plantings (specifically, where overhead wires limit woody vegetation).

Given the habitat that the woodlands and other treed features provide for migrating birds, it is recommended that the period where tree removal is to be avoided is extended from April 1 to August 31. Most of the song birds that will utilize the woodlands will migrate through and breed in the area during this time, and impacts to these birds can be avoided by adhering to this time frame. Adherence to this timing window will also avoid impact to any bats that may be in the area during this time.

The proposed development has been designed to avoid impacts to wildlife habitat where at all possible. Tree removal will be required based on overlaps with the proposed development footprint. Given the abundance of woodland areas surrounding the subject property, tree removal in these areas is not anticipated to have a negative impact on available wildlife habitat in the study area.

Regulated Species at Risk

Monarch

Monarch adults are found in a diversity of habitats with a variety of vegetation, while caterpillars are confined to meadows and open areas where their larval food plants, milkweeds (*Aesclepias* spp.), grow. Adult Monarch butterflies were observed within the subject property during surveys in 2023. Common Milkweed (*Asclepias syriaca*) was found in small proportions within the small Cultural Meadow (CUM1-1) community within the subject property, but no Monarch caterpillars were observed.

Mitigation, Protection, and Enhancement

The Cultural Meadow community with Common Milkweed will be protected by the 15m watercourse buffer surrounding the Lake Road Drain. It is recommended that Milkweed species are included in any restoration and revegetation plans for the subject property to enhance Monarch habitat.

Bank Swallow

Bank Swallows nest in burrows in natural and human-made settings with vertical faces in silt and sand deposits. They usually nest on banks of river and lakes, but are also found in sand and gravel pits. Bank Swallows were observed within the agricultural field to the north of the subject property during both breeding bird surveys in 2023, but were not observed on the subject property, nor was suitable habitat observed on the subject property.

Mitigation, Protection, and Enhancement

The Bank Swallow habitat within the larger study area, if present, will not be directly impacted by the proposed development. No suitable habitat was documented within the subject property. Indirect impacts such as lighting and noise will be mitigated as discussed in Section 6.5.4.

Red-headed Woodpecker

Red-headed Woodpeckers requir cavity trees at least 40 cm in DBH and are found in a variety of habitats including open deciduous forest and forest edges, fields, park, pasture lands, wooded swamps, orchards, and groves of dead trees. A Red-headed Woodpecker was observed south of the subject property during a site visit in 2023.

Mitigation, Protection, and Enhancement

Suitable habitat for Red-headed Woodpecker (limited to the protected woodland communities) will not be directly impacted by the proposed development. Indirect impacts such as lighting and noise may impact Red-headed Woodpecker and other wildlife, and mitigation for these impacts are discussed in section 6.5.4.

Confirmed Significant Wildlife Habitat

Seasonal Concentration Area: Turtle Wintering Area

Turtle wintering area SWH has been confirmed for the purposes of this EIS in the MAS2 wetland through the observation of three young Snapping Turtles in early spring. The SWH occurs within the wetland buffer and is not expected to be impacted by the development activity. While turtle overwintering habitat was not confirmed for the central golf course pond, and it is not considered significant, it is possible that it may be utilized by turtles.

Mitigation, Protection, and Enhancement

The MAS2 wetland will be protected throughout the proposed development by a 15m buffer. The adjoining watercourse will be protected by a 15m buffer on either side. These buffers will mitigate any disturbance associated with the development and human activity, protect shade and cool microclimates, reduce sedimentation, and contribute structure and nutrients to the existing habitat features. A 15m buffer also provides phyto-remediation of pollution inputs, trapping pollutants and slowing turbid waters prior to entering aquatic features.

To minimize disturbance to turtles during construction, any construction activities should occur during daylight hours. Any artificial lighting used for construction purposes should be turned off or directed away from natural features. The limit of all construction activities should be clearly delineated to avoid unnecessary encroachment into natural features and habitats.

Habitat for SCC: Special Concern and Rare Wildlife Species

SWH is confirmed for Snapping Turtle on the subject property. Several SCC birds were observed within the subject property, including Purple Martin, Barn Swallow, Eastern Wood-pewee, and Tufted Titmouse.

Mitigation, Protection, and Enhancement

Forested features within and surrounding the subject property will be retained, with 10m buffers applied from the dripline. In addition to the protection of forested features from human disturbance, the revegetation of these buffers with native species will also contribute to creating high-quality edge habitat. It is therefore expected that the proposed development will not impact the overall habitat availability for Eastern Wood-pewee. Vegetation removal is recommended to occur outside of the breeding and nesting season for migratory birds as established by the Canadian Wildlife Service. The peak breeding period for birds this area of Ontario is April 5 and August 26 (CWS 2023a), although NRSI recommends extending this to April 1 and August 31 for construction purposes.

The MAS2 wetland, the confirmed SWH where Snapping Turtles were observed, will be retained and protected with an additional 15m buffer.

6.5 Indirect Impacts and Mitigations

Indirect impacts are identified as effects that are not a direct result of the proposed development footprint and often occur in areas adjacent to the development footprint or as a result of complex impact pathways. Construction of the proposed development has the potential to cause indirect impacts to adjacent natural features and functions if not mitigated appropriately.

The following sections discuss potential indirect impacts associated with the proposed development:

- Potential Impacts to Aquatic Ecology;
- Sedimentation and Erosion;
- Injury to Trees or their Root Systems; and
- Indirect Impacts to Wildlife and Vegetation Communities.

6.5.1 Potential Impacts to Aquatic Ecology

The proposed development includes grading and the installation of stormwater management infrastructure. These components have the potential to alter the existing hydrological conditions of the subject property. The existing hydrological regimes of the wetlands and watercourses on the subject property will largely be maintained based on the preliminary concept plan. A description of these potential impacts and recommended mitigation measures are provided in the sections below.

To reduce the potential for water and soil contamination during construction, machinery maintenance should occur at a designated location away from the natural areas on-site. No storage of equipment, materials or fill is to occur within the natural areas.

Surface Water Runoff Changes and Soil Compaction

Surface water and groundwater recharge should be considered in any lot development. A portion of the catchment area will be converted to impervious areas (i.e. houses, paved driveways, etc.) post-development.

Care should be taken to avoid excessive compaction activities adjacent to the woodland community to maintain the infiltration capacity of soils within the development area and natural feature setbacks. Soil amendments, consisting of applying topsoil to an approximate depth of 30cm should be considered for yard, lawn and garden areas surrounding the houses. Additional topsoil will provide added pore space for water retention and a good growth medium

for grass and other planted material. Opportunities for groundwater infiltration should be incorporated into the development design, such as soak away pits, rain gardens, and dry swales. Drain spouts from roofs should be directed to vegetation areas away from the buildings, allowing water to infiltrate into the ground or run into rain barrels for future use.

To reduce the potential for water and soil contamination during construction, machinery maintenance should occur at a designated location away from the natural areas on-site. No storage of equipment, materials or fill is to occur within the natural areas.

Changes to Groundwater

The Kettle Creek golf course currently uses surface and groundwater for irrigation purposes. Groundwater volumes used for golf course maintenance are unknown, but it can be anticipated that the overall groundwater system throughout the subject property is already being impacted by human activity to some degree.According to LDS (2024), *"Groundwater is present within the near-surface sandy soils, and/or intermittent sand layers"*. However, "*conventional groundwater control methods are expected to be suitable for shallow excavations*". Additionally, "*the placement of fill soils throughout the site to raise grades, or to balance the cut-fill requirements across the site, may alter soil conditions and the effective depth to groundwater*". Measures to protect and maintain groundwater have been outlined throughout the Geotechnical Report (LDS 2024). These include Low Impact Development (LID) measures to reduce leeching of toxins and balance stormwater.

Changes to Water Quality

Wetlands and watercourses within the study area are vulnerable to contamination from surface water sources. Post-development, untreated parking lot and access road runoff can introduce contaminants such as heavy metals, and oils. It is also expected that an increase in salt application will occur following the development of roads, driveways, and sidewalks. Salt-laden water that is discharged into water bodies, including wetlands and watercourses, can be particularly damaging to fish, other wildlife and vegetation.

Mitigation, Protection, and Enhancement

Additionally, it is recommended that a Salt Management Plan (SMP) be developed and implemented to reduce the impact of road salt chlorides on watercourses and wetlands on the subject property. This may entail efforts to reduce overall salt application rates on the site or restricting salt application to specific locations. Limited applications of smaller-grained salt can

be effective between 0 and -10C. Beyond -10C, salt is ineffective at melting ice and should not be applied. Salt use can also be minimized through the manual breaking and clearing of ice, where feasible. A SMP should be prepared at a later design stage.

6.5.2 Sedimentation and Erosion

During construction, areas of bare soil will be exposed that have the potential to erode during rainfall events and impact adjacent natural features. In the event of a heavy rain or snow melt event, sediment laden runoff can enter adjacent natural areas by way of overland flow. During the site grading work, suitable sedimentation controls will be required to help control and reduce the turbidity of run-off water that may flow towards the surface water features. As construction work progresses at the site, regular maintenance and additional sedimentation measures may be required to limit the effect of siltation of run-off water in localized areas. In order to protect off-site natural features from potential impacts due to sediment, an ESC plan must be developed and implemented prior to any construction activities on the site, including any vegetation removal and clearing.

The construction site should be surrounded by sediment and erosion control fencing prior to any form of development or site alteration. This fencing will act to protect trees which are to be retained, as well as protect off-site areas from erosion and sedimentation. The sediment and erosion control fence should be maintained in good working order for the entire construction phase, and be removed once all development is complete. Any steep slopes on the property will require special care to avoid erosion and sedimentation.

Mitigation, Protection, and Enhancement

As outlined in the Geotechnical Report (LDS 2024), *"Surface water quality can be detrimentally impacted by uncontrolled erosion and sediment discharge from the site. As such, it is imperative that an adequate Sediment and Erosion Control Strategy be established for the site*".

The Geotechnical Report (LDS 2024) outlines recommendations regarding Sediment and Erosion control, which will be incorporated into later design stages. In particular, it states that *"Sediment and erosion control measures will be required during construction, particularly around the perimeter of the site, to contain sediment and prevent discharge towards the neighbouring properties and surface water features. A multi-barrier approach is recommended. The design of the Sediment and Erosion Control Plan for the site will need to incorporate suitable erosion*

control practices and strategies which are suitable to site conditions, and have regard for contingency measures planned in the event that the integrity of the system is compromised."

An ESC Plan should be developed for the subject property at a later design stage. This plan should outline guidelines for the placement of ESC fencing, stripping and placement of topsoil stockpiles, construction of temporary sediment control ponds and temporary swales for runoff redirection, and revegetation of completed areas. Any exposed soils and steep slopes within the subject property will require special care to avoid erosion and sedimentation, and should be seeded immediately following grading activities.

Heavy-duty filter fabric ESC fencing should be installed along the limit of disturbance prior to any form of construction or site alteration, including any vegetation removals, and clearing and grubbing. The heavy-duty ESC fencing should be combined with Tree Protection Fencing where possible. The heavy-duty ESC is to be maintained in good working order by the developer and/or their representative for the entire construction phase, and be removed once all development is complete and exposed soils are stabilized to the satisfaction of the Contract Administrator and/or Environmental Monitor.

6.5.3 Injury to Trees or their Root Systems

Given the presence of natural areas within the proposed development, injury to tree limbs or their root systems from construction activities (e.g. grading, excavation, etc.) and machinery may occur. Soil compaction adjacent to the woodlands could cause damage to trees through the reduction in soil water retention and infiltration of water around the tree roots. To protect the trees and their root systems from harm during construction activities, the development limit is to be delineated using heavy-duty sediment fence (ESC) or temporary tree protection fencing. This fencing will protect trees and their root systems from construction activities; however, should any limbs or roots of trees to be retained be damaged during construction appropriate arboricultural techniques should be used to prune the affected areas.

6.5.4 Indirect Impacts to Wildlife and Vegetation Communities

Indirect disturbances can stress natural features and weaken their ecological integrity. In these states, natural features are more prone to the establishment and proliferation of invasive, non-native species such as Common Buckthorn and Common Reed, which are present on the subject property. Proliferation of invasive, non-native species within natural communities

decreases their ecological value by suppressing native species, decreasing biodiversity, and reducing habitat suitability for native fauna.

Nearby adjacent vegetated communities have the potential for indirect impacts. Designated areas for construction lay-down, vehicle access and parking, equipment storage, materials stockpiling, and any on-site construction offices should be located entirely outside of established protected areas.

Potential indirect impacts to wildlife and vegetation communities may arise from noise, vibrations, human presence, unnatural lighting during construction and resulting from the development, and dust associated with construction activities. The surrounding area already contains many of these activities due to common residential stresses, including street and home lighting, local inhabitants, and pre-existing roads. Artificial lighting can have long-term impacts on wildlife in the adjacent natural features. Dust has the potential to cover vegetation, reducing photosynthetic rates, slowing evapotranspiration, and in effect, interrupting thermoregulating processes. During site preparation and construction activities involving a lot of noise, such as site grubbing and grading activities, wildlife may temporarily avoid the area. Indirect impacts associated with construction are anticipated to be minimized, localized, and temporary, and it is expected that displaced wildlife species will return to the vicinity of the subject property following construction. Therefore, significant impacts to wildlife from noise and dust are not expected.

Mitigation, Protection, and Enhancement

To reduce impacts to wildlife from noise, vibrations and light from construction equipment, daily construction activities should be restricted to between 7:00am and 7:00pm. This timing restriction should also apply to the use of generators or pumps, as much as possible. Lighting associated with construction activities should be turned off following daily cessation of activities or directed away from neighbouring natural features to reduce the impacts resulting from increased artificial lighting on natural features and wildlife. In order to suppress dust, areas of bare soil should be moistened with water during construction activities to ensure that the amount of dust within the subject property is reduced. Topsoil stockpile locations should be in areas of lesser wind exposure and away from natural features and their buffers.

Clearly defined construction limits should be established to avoid unnecessary vegetation removal. Where trees are located along the natural feature edges to be retained, protective tree fencing should be installed at least 10m from the dripline where possible to adequately protect

the root zone from soil compaction and other disturbances. Designated areas for construction lay-down, vehicle access and parking, equipment storage, materials stockpiling, and any on-site construction offices should be located entirely outside the retained natural features and their buffers, and preferably located away from buffers so as to limit potential to indirectly impact the adjacent natural features.

Detailed lighting designs will be provided at the detailed design stage. Lighting designs should include directional lighting for developments that are within 30m of natural features to eliminate lightwash. It is recommended that only full cutoff fixtures be utilized, which direct all light directed below the horizontal plane to avoid glare, reduce light pollution and minimize light trespass on adjacent properties. Any directional lighting should be directed away from the natural areas surrounding the property. Lighting fixtures should be compliant with the International Dark Sky Association Standard (2020).

6.6 Induced Impacts and Mitigations

Induced impacts are described as those that are not directly related to the construction or operation of the facilities in question, but rather arise from disturbances to the natural areas as a result of the development. The simplest example is increased use of a natural area by residents or users of the property, feral domestic wildlife, and unauthorized trail/pathway construction. In particular, the development may lead to an increase in human access to the adjacent natural features with associated potential for habitat degradation (e.g., vegetation trampling or damage, littering, creation of informal paths and associated soil erosion, spread of non-native or invasive species through foot traffic). Habitat degradation may subsequently facilitate the further establishment of non-native, invasive species such as Common Buckthorn. Increased human population in the immediate vicinity will also increase the potential for domestic animal (e.g., cat (*Felis catus*)) access to surrounding natural areas. Easier access provided to these animal groups may impact nesting success and direct mortality among certain small-size wildlife, such as passerine birds. As residential units are present within the surrounding areas, these impacts have already been introduced to the surrounding areas. If the mitigations listed below are followed, significant induced impacts are not anticipated.

Mitigation, Protection, and Enhancement

Use of the natural areas by community residents or other users is difficult to control. Education with respect to the values and implications of the neighbouring natural areas and unique species is one tool that can be used. Signage should be used to direct community members or

other recreational users not to trespass into sensitive natural areas. A new homeowner's brochure should be developed to educate new residents on the important natural features and species in their neighbourhood. This should outline steps homeowners can take to protect the natural area such as keeping cats indoors, discouraging dumping, and staying on designated paths.

Permanent fencing between properties and natural areas should be erected to assist in preventing human-induced impacts to natural areas. Buffer plantings should include native species to Elgin County that discourage the establishment of invasive species, and discourage foot traffic. Landscape plantings within the site should incorporate hardy native species to the greatest extent possible. Aggressive non-native invasive species such as Norway Maple (*Acer platanoides*), Periwinkle (*Vinca minor*), Goutweed (*Aegopodium podagraria*), Day Lilly (*Hemerocallis* sp.), Lily-of-the-Valley (*Convallaria majalis*) and English Ivy (*Hedera helix*) should be prohibited in landscaping plans.

7.0 Summary

Natural Resource Solutions Inc. (NRSI) was retained by James Glover to complete an Environmental Impact Study (EIS) in support of a proposed residential development at 320 Carlow Road, Port Stanley, Ontario. The EIS has been informed by a review of background information, including relevant policies and bylaws, correspondence with agency staff, and biological surveys. This report discusses potential residential and construction impacts that are likely to occur as a result of the proposed residential development. This report provides an evaluation of the form, function, and significance of natural features and wildlife habitat on the subject property.

The proposed development at this time is not anticipated to result in significant impacts to the natural features and wildlife habitat within the subject property if the recommended mitigation and protection measures are implemented. To minimize the impact of the development on the ecological features and functions of the subject property, the following mitigation measures are recommended:

- Implement a 15m buffer around the MAS2 wetland and all watercourse branches;
- Implement a 10m buffer around all woodlands, based on the dripline;
- Design a native planting plan for all buffer areas;
- The buffer planting plan should be designed to incorporate species that provide forage and nectaring opportunities for wildlife, including meadow openings among tree and shrub plantings
- A minimum of 30cm of topsoil should be applied to the final graded site to allow for productive vegetative establishment and growth for the new community;
- Where the existing entranceway runs along the edge of treed features, proposed hardscaping and related construction is to be confined to the existing hardscaping limits;
- Follow recommendations for tree protection as outlined in the TIPP;
- Conduct construction activities outside of the migratory bird breeding window;
- Artificial lighting used for construction purposes should be turned off daily following construction activities or directed away from natural features;
- Areas of bare soil should be moistened with water during construction activities to suppress dust;

- The limit of all construction activities should be clearly delineated to avoid unnecessary encroachment into natural features and habitats;
- Machinery maintenance should occur at a designated location away from the natural areas on-site. No storage of equipment, materials or fill is to occur within the natural areas;
- Implement a Salt Management Plan (SMP) to reduce the impact of road salt chlorides;
- Permanent fencing between properties and natural areas should be erected to assist in preventing human-induced impacts to natural areas.
- Implement an Erosion and Sediment Control (ESC) Plan; and
- Daily construction activities should be restricted to between 7:00am and 7:00pm to reduce impacts to wildlife from noise, vibrations and light from construction equipment.

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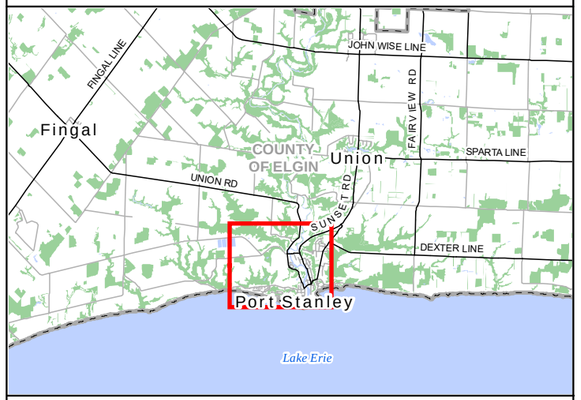
Maps

Map 1

Kettle Creek Golf Course

Study Area and Natural Features



Legend

- Study Area
- Subject Property
- 1km Buffer
- Railway
- Primary Road
- Secondary Road
- Permanent Watercourse
- Intermittent Watercourse
- Water Body
- Other Wetland (Non-PSW)
- Wooded Area
- ANSI, Earth Science

Aquatic Resource Areas (ARA)

- ARA Survey Point
- ARA Line Segment
- ARA Polygon

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Aquatic, Terrestrial and Wetland Biologists

Project: 2982
Date: December 22, 2022

NAD83 - UTM Zone 17
Size: 11x17"
1:11,000

0 200 400 600 Metres

N

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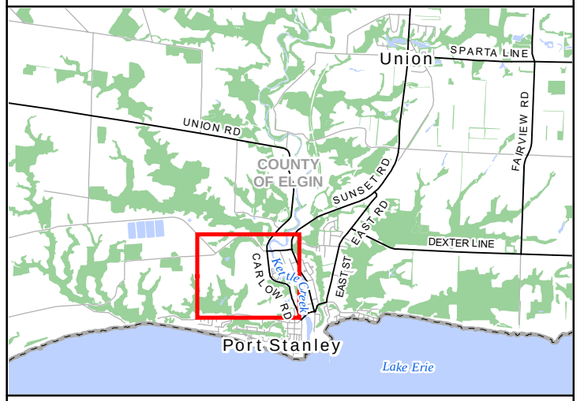
Map 2

Kettle Creek Golf Course, Port Stanley

Vegetation Communities



Legend

- Subject Property
- Railway
- Primary Road
- Secondary Road
- Permanent Watercourse
- Intermittent Watercourse
- Ecological Land Classification (ELC)
- (Ag) Agriculture
- (CUM1-1) Dry - Moist Old Field Meadow
- (CUP3-2) White Pine Coniferous Plantation Type
- (CUT) Cultural Thicket
- (CUT1) Mineral Cultural Thicket Ecosite
- (CUT1-5) Raspberry Cultural Thicket
- (CUW) Cultural Woodland
- (CUW1) Mineral Cultural Woodland Ecosite
- (CUW2) Bedrock Cultural Woodland Ecosite
- (FOD) Deciduous Forest
- (FOD5) Dry - Fresh Sugar Maple Deciduous Forest Ecosite
- (FOD5-2) Dry - Fresh Sugar Maple - Beech Deciduous Forest Type
- (FOD7) Fresh - Moist Lowland Deciduous Forest Ecosite
- (H) Hedgerow
- (MAS2) Mineral Shallow Marsh Ecosite
- (OA) Open Water
- (Res) Residential
- (SA) Shallow Water
- (SAS1) Submerged Shallow Aquatic
- (SWD) Deciduous Swamp

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Project: 2982
Date: October 28, 2024

NAD83 - UTM Zone 17
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1:5,500

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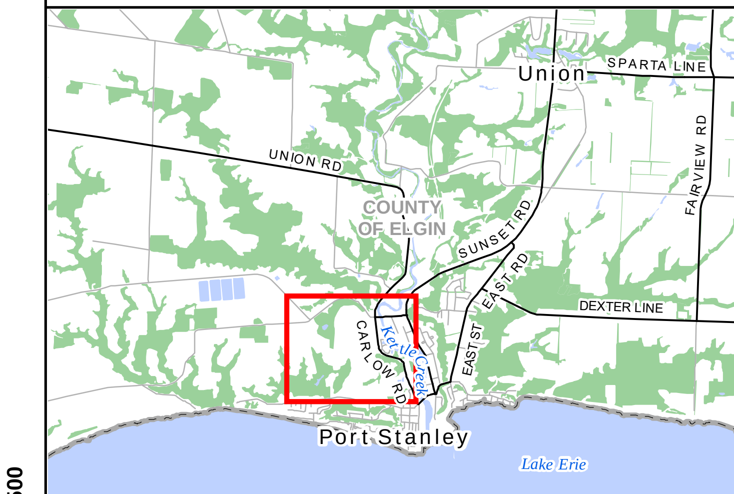
Map 4

Kettle Creek Golf Course, Port Stanley

Monitoring Stations



Legend

- Property Boundary
- Breeding Bird Station (BB)
- Anuran Call Station (ANR)
- Railway
- Primary Road
- Secondary Road
- Permanent Watercourse
- Intermittent Watercourse
- Fish Community Assessment
- Ecological Land Classification (ELC)
- (Ag) Agriculture
- (CUM1-1) Dry - Moist Old Field Meadow Type
- (CUP3-2) White Pine Coniferous Plantation Type
- (CUT) Cultural Thicket
- (CUT1) Mineral Cultural Thicket Ecosite
- (CUT1-5) Raspberry Cultural Thicket Type
- (CUW) Cultural Woodland
- (CUW1) Mineral Cultural Woodland Ecosite
- (CUW2) Bedrock Cultural Woodland Ecosite
- (FOD) Deciduous Forest
- (FOD5) Dry - Fresh Sugar Maple Deciduous Forest Ecosite
- (FOD5-2) Dry - Fresh Sugar Maple - Beech Deciduous Forest Type
- (FOD7) Fresh - Moist Lowland Deciduous Forest Ecosite
- (H) Hedgerow
- (MAS2) Mineral Shallow Marsh Ecosite
- (OA) Open Water
- (Res) Residential
- (SA) Shallow Water
- (SAS1) Submerged Shallow Aquatic
- (SWD) Deciduous Swamp

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2982
Date: October 28, 2024

NAD83 - UTM Zone 17
Size: 11x17"
1:5,500

0 50 100 150 200 250 300 350 Metres

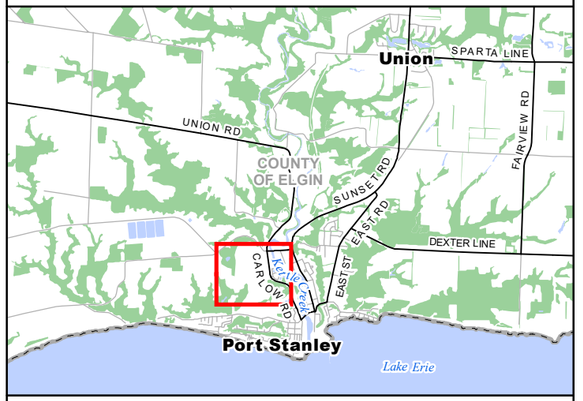
N

Path: X:\2982_KettleCreekGC_PortStanley\NRSI_2982_Map4_MonitoringStations_6K_2024_10_28_KB.mxd

Map 4

Kettle Creek Golf Course

Opportunities and Constraints



Legend

- Property Boundary
- Proposed Site Plan
- Inventoried Tree (Crown to Scale)
- Candidate Bat Roost Tree
- Seep
- Railway
- Permanent Watercourse
- Intermittent Watercourse
- Dripline (NRSI December 14, 2023 and March 11, 2024)
- Dripline Buffer (10m)
- Wetland Boundary (NRSI July 21, 2023)
- Wetland Buffer (15m)
- Watercourse (Warm Water)
- Watercourse Buffer (15m)
- Ecological Land Classification (ELC)
- (Ag) Agriculture
- (CUM1-1) Dry - Moist Old Field Meadow Type
- (CUP3-2) White Pine Coniferous Plantation Type
- (CUT) Cultural Thicket
- (CUT1) Mineral Cultural Thicket Ecosite
- (CUT1-5) Raspberry Cultural Thicket Type
- (CUW) Cultural Woodland
- (CUW1) Mineral Cultural Woodland Ecosite
- (CUW2) Bedrock Cultural Woodland Ecosite
- (FOD) Deciduous Forest
- (FOD5) Dry - Fresh Sugar Maple Deciduous Forest Ecosite
- (FOD5-2) Dry - Fresh Sugar Maple - Beech Deciduous Forest Type
- (FOD7) Fresh - Moist Lowland Deciduous Forest Ecosite
- (H) Hedgerow
- (OA) Open Water
- (Res) Residential
- (SA) Shallow Water
- (SAS1) Submerged Shallow Aquatic Ecosite
- (SWT2-2) Willow Mineral Thicket Swamp Type

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2982
Date: February 14, 2025

NAD83 - UTM Zone 17
Size: 11x17"
1:4,000

0 40 80 120 160 200 240 Metres

N

Path: X:\2982_KettleCreekGC_PortStanley\NRSI_2982_Map4_Opportunities_Constraints_4K_2025_02_14_LRC.mxd

Appendix I
Site Plan

SUBJECT TO THE CONDITIONS, IF ANY, SET FORTH IN OUR LETTER DATED _____ DAY OF _____, 20__, THIS DRAFT PLAN IS APPROVED UNDER SECTION 51 OF THE PLANNING ACT THIS _____ DAY OF _____, 20__.

DATE SIGNATURE

NORTH

Pt	NORTHING	EASTING
200	4726562.40	409542.50
201	4726579.50	409525.90
202	4726591.50	409514.50
203	4726601.20	409505.00
204	4726607.00	409500.20
205	4726609.90	409495.90
206	4726613.40	409493.40
207	4726616.30	409489.30
208	4726620.10	409486.50
209	4726624.30	409483.00
210	4726628.50	409479.50
211	4726630.70	409476.20
212	4726633.90	409473.30
213	4726638.40	409469.20
214	4726642.70	409465.90
215	4726645.80	409461.40
216	4726648.00	409458.80
217	4726651.00	409458.10
218	4726652.80	409456.50
219	4726653.80	409453.60
220	4726658.70	409451.80
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222	4726667.40	409443.50
223	4726672.00	409441.10
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225	4726676.80	409436.80
226	4726678.80	409434.80
227	4726681.60	409434.20
228	4726684.10	409432.70
229	4726687.30	409432.40
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231	4726694.40	409426.30
232	4726698.70	409424.50
233	4726704.60	409419.80
234	4726708.90	409418.60
235	4726711.30	409416.10
236	4726713.70	409415.50
237	4726717.20	409413.10
238	4726725.60	409408.20
239	4726731.00	409404.40
240	4726734.00	409404.10
241	4726737.90	409400.60
242	4726739.70	409399.20
243	4726744.50	409396.30
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252	4726770.70	409381.00
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254	4726775.20	409379.40
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256	4726779.70	409378.00
257	4726781.10	409376.60
258	4726782.50	409375.10
259	4726783.40	409373.50
260	4726784.20	409371.90
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262	4726786.90	409371.70
263	4726789.60	409370.90
264	4726792.30	409370.20
265	4726795.00	409368.50
266	4726797.60	409366.90
267	4726801.60	409364.20
268	4726805.10	409363.90
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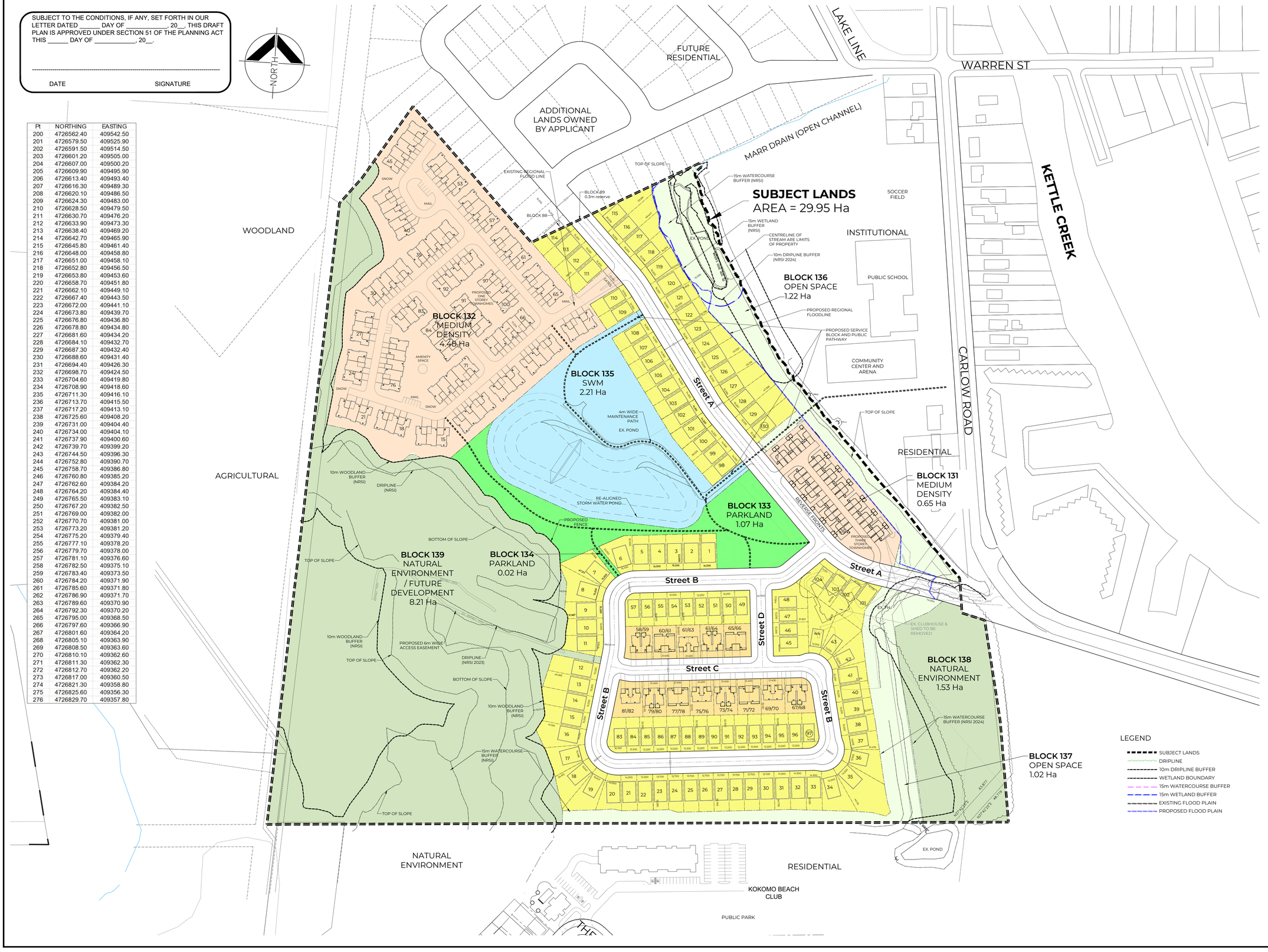


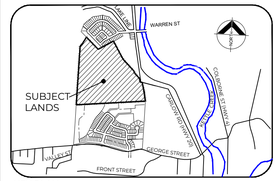
LEGEND

- SUBJECT LANDS
- DRIPLINE
- 10m DRIPLINE BUFFER
- WETLAND BOUNDARY
- 15m WATERCOURSE BUFFER
- 15m WETLAND BUFFER
- EXISTING FLOOD PLAIN
- PROPOSED FLOOD PLAIN

MONTEITH BROWN
PLANNING CONSULTANTS
219 OXFORD STREET WEST, UNIT 302
LONDON, ONTARIO. N6H 1S5 519.686.1300
WWW.MBPC.CA

DRAFT PLAN OF SUBDIVISION

LOT 15 & PART OF LOT 16 CLERGY, RESERVE LOT D. PART RD ALLOW
RP 11R-7427 PARTS 1 TO 10
(Geographic Township of Southwold)
MUNICIPALITY OF CENTRAL ELGIN,
COUNTY OF ELGIN



KEY PLAN
N.T.S.

OWNER'S CERTIFICATE

I, Jay McGuffin of Monteith Brown Planning Consultants, am authorized to submit this Draft Plan of Subdivision on behalf of the owners.

Jay McGuffin, MCIP, RPP
MBPC, Principal Planner — Date

SURVEYOR'S CERTIFICATE

I hereby certify that the boundary of the lands to be subdivided as shown on this plan and their relationship to the adjacent lands are accurately and correctly shown.

J. Paul Crocker, OLS
Callon Dietz Incorporated — Date

REQUIREMENTS UNDER SECTION 51 (17) OF THE PLANNING ACT, 1990

a) as shown on plan
b) as shown on plan
c) as shown on key plan
d) as shown on land use schedule
e) as shown on plan
f) as shown on plan
g) as shown on plan
h) municipal water
i) silt, sand, sand and gravel, and silt till
j) as shown on plan
k) municipal sewers
l) as shown on plan

LAND USE SCHEDULE

LAND USE	AREA (Ha)	%
SINGLE DETACHED LOTS	5.87	29.0
SEMI DETACHED LOTS	0.90	4.5
MEDIUM DENSITY BLOCKS	5.13	25.4
PARKLAND	1.09	5.4
STORM WATER MANAGEMENT	2.21	10.9
OPEN SPACE	2.24	11.1
STREETS A TO D	2.77	13.7
DEVELOPABLE AREA	20.21	100.0
NATURAL ENVIRONMENT	9.74	
TOTAL SITE AREA	29.95	

No.	Revision	Date	Initial
2	SUBMIT FOR COMMENTS	DEC 2024	BS
1	PRE CONSULTATION	OCT 2024	BS

BAR SCALE
1: 1,500
0 15 30 45 60m

ADDRESS
320 CARLOW ROAD
KETTLE CREEK GOLF COURSE
PORT STANLEY

DRAWN BY:	CHECKED BY:	PROJECT No. :
BS	PM	22-1800
DESIGNED BY:	APPROVED BY:	DRAWING No.
BS	JMC	1
SCALE: on 24x36 1:1500	DATE: Feb 06, 2025	

Appendix II
Issues Scoping Report and Terms of Reference

Kettle Creek Golf Course, Port Stanley

Issues Scoping Report

Prepared for:

Jay McGuffin
Monteith Brown Planning Consultants
610 Princess Avenue
London, ON
N6B 2B9

Project No. 2982 | February 2023

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Kettle Creek Golf Course, Port Stanley
Issues Scoping Report

Project Team

Nyssa Hardie	Ecohydologist, Project Advisor
Jeremy Bannon	Terrestrial and Wetland Biologist/Certified Arborist, Project Manager
Hashveenah Manoharan	Terrestrial and Wetland Biologist/Certified Arborist
Katie Croutch	Terrestrial and Wetland Biologist
Gerry Schaus	GIS Analyst

Report submitted on February 6, 2023

Jeremy Bannon B.E.S.
Project Manager
Terrestrial and Wetland Biologist/Certified Arborist

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1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained by Monteith Brown Planning Consultants to complete an Issues Scoping Report (ISR) in support of a proposed residential development at 320 Carlow Road, Port Stanley, Ontario ("the subject property"). The subject property is currently an active golf course known as the Kettle Creek Golf and Country Club, and is located within the Municipality of Central Elgin, County of Elgin.

The subject property is approximately 30ha in area, borders Carlow Road to the east, a proposed subdivision to the north, a subdivision currently under construction to the south, and agricultural lands and woodlands to the west. The surrounding landscape is predominantly agricultural, with several adjoining wooded areas, wetlands, and watercourses. A drain runs within the eastern edge of the subject property boundary, and another is found adjacent to the southern edge. Kettle Creek flows to the east of the subject property, beyond Carlow Road. Most of the subject property is comprised of maintained lawn and isolated hedgerows. A single, large golf pond is located centrally on the property. Wooded features within the property include small cultural plantations, cultural woodland, and deciduous forest (Map 1).

Significant natural heritage features have been identified within the subject property and surrounding area, as indicated by the Municipality of Central Elgin Official Plan (CEOP, 2022) and County of Elgin Official Plan (EOP, 2015). In accordance with CEOP (2022), an ISR is required to assess the significance and function of existing natural features within the subject property, as well as identifying potential cumulative effects of the proposed activity.

This report describes the proposed undertaking and summarizes background information on natural heritage features found within the study area. It provides a preliminary assessment of the significance, sensitivity, and function of these natural features, and addresses potential cumulative effects on natural features as a result of the proposed undertaking. This ISR and Terms of Reference (Appendix I) has been prepared in accordance with the requirements outlined in the EOP (2015) and the CEOP (2022).

1.1 Proposed Undertaking

This ISR is in support of a proposed residential development within the subject property. These residences will include single detached houses, townhouses, roadways, and stormwater management ponds. The southwestern portion of the subject property will be retained for use

as an active golf course by the Kettle Creek Golf and Country Club. The existing large, central pond will be kept for use as an outdoor amenity area.

1.2 Project Scoping

The proposed EIS and TIPP will provide background information, methods and findings of field surveys, and a variety of impact analyses that rely on a pre-defined set of geographical terms. This section aims to clarify important terms that will be used throughout both reports.

The term *development area* refers to the location where construction will be required to facilitate the proposed development. This will include grading activities that may extend past the final developed footprint. This area is not yet finalized and will be determined through iterative, multidisciplinary reviews and discussions. It is anticipated that this area will be a subset of the subject property.

The term *subject property* refers to the legal lands owned by the proponent, as seen in Map 1. The term *study area* refers to the subject property and lands within 120m, and contiguous natural features beyond this 120m boundary (Map 1). The 120m radius that is included in the study area has been selected based on several policy definitions that must be considered during the development of an EIS. Primarily, these are:

- The definition of “adjacent lands” provided in the Natural Heritage Reference Manual (MNRF 2010), which requires the assessment of potential impacts on all relevant ecological receivers and wildlife habitat for any development within 120m; and
- The inclusion of potential regulated habitat for several Species at Risk (SAR).

Finally, the study area is nested within a broader geographical area for which a variety of available background information sources was reviewed. Legacy data will be collected from several atlases, which is available in 10x10km grids, as well as the Natural Heritage Information Centre (NHIC) database, which is available in 1x1km grids (MNRF 2022). These areas are referred to where necessary by their applicable grid. Information will be compiled from the 10x10km atlas square that overlaps the subject property (square 17MH81). Legacy data is available from NHIC within the 1x1km atlas square overlapping the subject property (square 17MH8124).

2.0 Background Review

In order to determine a study approach for the EIS, existing natural heritage information was first gathered and reviewed to identify key natural heritage features and species that are known or have the potential to occur within the study area. Background information on the natural environment features within the study area vicinity was also gathered from the Ministry of Natural Resources and Forestry (MNRF) Natural Heritage Information Centre (NHIC) online significant species database (MNRF 2022a), the Ministry of Environment, Conservation and Parks (MECP), the MNRF's Land Information Ontario mapping, and relevant taxa-specific databases, as listed below.

Initial wildlife species lists were compiled to provide information on species reported from the vicinity of the study area (10km radius) using various online atlases. These initial species lists were used to guide the scope and type of wildlife surveys required, as outlined in the following sections. The sources that were reviewed to inform project scoping included the following:

- Natural Heritage Information Centre (NHIC) (MNRF 2022a);
- Natural Heritage Reference Manual (MNRF 2010);
- Significant Wildlife Habitat Technical Guide (OMNR 2000);
- Significant Wildlife Habitat Criteria Schedules For Ecoregion 7E (MNRF 2015);
- Ontario Mammal Atlas (Dobbyn 1994);
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2019);
- Ontario Butterfly Atlas (Macnaughton et al. 2022);
- Ontario Odonata Atlas (MNRF 2022b);
- Ontario Breeding Bird Atlas (Bird Studies Canada (BSC) et al. 2006);
- Ministry of Environment, Conservation and Parks (MECP) Species at Risk;
- Government of Canada Species at Risk Act (SARA) Registry (2022);
- Department of Fisheries and Oceans (DFO) Aquatic Species at Risk mapping (DFO 2022);
- Aquatic Resource Area (ARA) Data (Government of Ontario 2020);
- Municipality of Central Elgin Official Plan (Municipality of Central Elgin 2022); and
- County of Elgin Official Plan (Elgin County 2015).

2.1.1 Species at Risk and Species of Conservation Concern Screening

Based on the initial species lists, several Species at Risk (SAR) and Species of Conservation Concern (SCC) were identified as having records from within the vicinity of the study area. Species at Risk (SAR) are those listed on the Species at Risk in Ontario List (MECP 2021). These include species identified by the Committee on the Status of Species at Risk in Ontario (COSSARO) as provincially Endangered, Threatened, or Special Concern. Species listed as Endangered or Threatened are protected under the Endangered Species Act (ESA) 2007, which includes protection to their habitat, and are referred to herein as "regulated SAR".

SCC include:

- species designated provincially as Special Concern,
- species that have been assigned a conservation status (S-Rank) of S1 to S3 or SH by the NHIC, and
- species that are designated federally as Threatened or Endangered by the Committee for the Status of Endangered Wildlife in Canada (COSEWIC) but not provincially by the COSSARO. These species may be protected by the federal Species at Risk Act (SARA) if they are listed as Threatened or Endangered on Schedule 1 of the SARA, but not provincially by the ESA.

Habitat for SCC is considered Significant Wildlife Habitat (SWH) (OMNR 2000), which is afforded protection under the Provincial Policy Statement (Ontario Ministry of Municipal Affairs and Housing (OMMAH) 2020) and municipal natural heritage protection policies. For the purposes of this report, the term *SAR* will refer to provincially Threatened and Endangered species regulated under the ESA while provincial species of Special Concern will be considered SCC.

Based on available background sources and federally or provincially significant species with occurrence records in the study area vicinity (within 10km for the OBBA), an assessment of SAR and SCC suitable habitat presence within the study area was completed. Assessments of habitat suitability in the study area were made by cross-referencing each species' known habitat preferences or requirements (e.g., OMNR 2000) with habitat availability based on satellite imagery interpretation and available mapping (Appendix II).

Based on the results of the screening, several SAR and SCC were identified as having potential for suitable habitat within the subject property and/or study area (Appendix II). A total of 14

SAR and SCC have been identified to potentially have suitable habitat in the subject property, which will require further study:

- Eastern Wood-pewee (*Contopus virens*)
- Barn Swallow (*Hirundo rustica*)
- Wood Thrush (*Hylocichla mustelina*)
- Red-headed Woodpecker (*Melanerpes erythrocephalus*)
- Eastern Meadowlark (*Sturnella magna*)
- Snapping Turtle (*Chelydra serpentina*)
- Woodland Vole (*Microtus pinetorum*)
- Eastern Small-footed Myotis (*Myotis leibii*)
- Northern Myotis (*Myotis septentrionalis*)
- American Badger (Southwestern Ontario population) (*Taxidea taxus jacksoni*)
- Monarch (*Danaus plexippus*)
- Butternut (*Juglans cinerea*)
- American Ginseng (*Panax quinquefolius*)
- Broad Beech Fern (*Phegopteris hexagonoptera*)

2.1.2 Significant Wildlife Habitat Screening

A screening for the presence of SWH was also completed for the study area. The Significant Wildlife Habitat Technical Guide (SWHTG) identifies wildlife habitats that may be significant in Ontario as well as criteria to identify these habitats for Ecoregion 7E, in which the study area is located (OMNR 2000, 2015). The SWHTG groups SWH into several broad categories: seasonal concentration areas, rare vegetation communities and specialized wildlife habitat, habitats of SCC, and animal movement corridors. The results of the preliminary SWH screening exercise are found in Appendix III.

3.0 Relevant Policies, Legislation and Planning Studies

Table 1 provides an overview of natural heritage-based policies, regulations and legislation that were considered and which informed the field program and analysis. To help inform suitable land-use concepts, guide the layout of development, and identify areas to be protected, inventoried natural features are evaluated against relevant policies, regulations and legislation outlined in the following section. The specific implications of these policies to the proposed development are discussed further below.

Table 1**. Relevant Policies, Legislation, and Planning Studies**

Policy/Legislation	Description	Project Relevance

Provincial Policy Statement (OMMAH 2020)	• Issued under the authority of Section 3 of the Planning Act and came into effect on May 1, 2020, replacing the 2014 PPS (OMMAH 2014).
	• One of the key goals of the PPS is to "[*provide*] *for appropriate development while protecting resources of provincial interest, public health and safety, and the quality of the natural and built environment."*
	• Section 2.1 of the PPS – Natural Heritage establishes clear direction on the adoption of an ecosystem approach and the protection of resources that have been identified as 'significant'. This section also identifies that natural features are to be protected for the long term.
	• Section 2.1.5 of the PPS identifies that development and site alteration shall not be permitted within the area outlined in sub-sections a) – f) *"unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions."*
	• The Natural Heritage Reference Manual (OMNR 2010) and the Significant Wildlife Habitat Technical Guide (OMNR 2000) were prepared by the MNRF to provide guidance on identifying natural features and in interpreting the Natural Heritage sections of the PPS.
		• Based on the background review, preliminary site visit, SWH screening, and SAR/SCC screening, several natural features afforded consideration within the PPS have been identified to possibly occur in the study area, including:
		  ○ Fish Habitat;
		  ○ Significant Wildlife Habitat; and
		  ○ Habitat for Endangered and Threatened Species
		• Significant Areas of Natural and Scientific Interest (ANSI) are also identified to occur just outside of the study area boundary. This Earth Science ANSI is described as the Port Stanley Till.
		• The PPS indicates that development or site alteration shall not be permitted within these features unless it has been demonstrated that there will be no negative impacts on the features or their ecological functions.
		• The EIS shall demonstrate that no negative impacts to these features will occur.

Endangered Species Act (Government of Ontario 2007)	• The original ESA, written in 1971, underwent a year-long review which resulted in a number of changes which came into force in 2007. • The ESA prohibits killing, harming, harassing, or capturing Endangered or	• Based on information available through background documents and field surveys, including the SAR/SCC screening, several SAR were identified as potentially having

Policy/Legislation	Description	Project Relevance
	Threatened and protects their habitats from damage and destruction. • In order to balance social and economic considerations with protection and recovery goals, the ESA also enables the MNRF to issue permits or enter into agreements with proponents in order to authorize activities that would otherwise be prohibited by subsections 9(1) or 10(1) of the Act provided the legal requirements of the Act are met.	suitable habitat within the study area. • The EIS shall demonstrate that no negative impacts to SAR will occur.
Species at Risk Act (SARA, Government of Canada 2002)	• SARA establishes the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as an independent body of experts responsible for assessing and identifying species at risk. • The SARA creates prohibitions to protect listed threatened and endangered species and their critical habitat.	• Any observed species listed by COSEWIC as endangered or threatened shall be protected, along with their habitat. • The EIS shall demonstrate that no impacts to SAR will occur.
Migratory Birds Convention Act (Canadian Wildlife Service (CWS) 2017)	• The MBCA protects migratory game birds, insectivorous birds, and several other migratory non-game birds from persecution in the form of harassment. • The schedule of on-site work must consider MBCA windows, with timing of breeding bird season typically occurring between May 1 and July 31, however, this is a guideline, since the MBCA applies to nesting bird species. • "Incidental take" is considered illegal, with the exception of a permit obtained by the CWS.	• The timing of construction activities, especially vegetation clearing and site grading must have consideration for the MBCA timing windows.
Fish and Wildlife Conservation Act (Government of Ontario 2019)	• The FWCA provides protection for certain bird species, not protected under the MBCA (e.g., raptors), as well as furbearing mammals and their dens or habitual dwellings, asides from the Red Fox (*Vulpes vulpes*) and Striped Skunk (*Mephitis mephitis*).	• The timing of construction activities, especially vegetation clearing and site grading must have consideration for bird nesting and den sites for fur-bearing mammals.
The Canadian *Fisheries Act* (Government of Canada 1985)	• Last amended in August 2019, the federal *Fisheries Act* provides for the protection of fish and fish habitat • Fish are protected through two core prohibitions: Section 34.4(1) prohibits the death of fish by means other than fishing, and Section 35(1) prohibits the harmful alteration, disruption, or destruction (HADD) of fish habitat (Government of Canada 2019).	• The municipal drains on and adjacent to the subject property provide direct fish habitat. • The need for project review by the Department of Fisheries and Oceans (DFO) Fish and Fish Habitat Protection Program (FFHPP) will be determined upon the completion of a proponent-led assessment of whether the

Policy/Legislation	Description	Project Relevance
	• Fish habitat is defined as "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".	proposed undertaking can meet all measures to protect fish and fish habitat (as outlined in the DFO's online Projects Near Water guidelines). • Should the proponent-led assessment indicate that impacts to fish and fish habitat may occur as a result of the proposed development, project review by the DFO will be necessary to determine if the proposed undertaking has the potential to contravene the Fisheries Act, and if an Authorization under the Act will be required.
Ontario Drainage Act (Government of Ontario 2021)	• The Act provides legislation and policies for the creation, maintenance, and repair of municipal drains in Ontario. • DFO"s drain classification system includes 7 categories that help to simplify the review and approval process for municipal drain works.	• The various constructed drains, including the Lake Road and Marr municipal drains, that occur on the subject property are not rated by the DFO. • The open channel Marr drain occurs to the northeast of the subject property and will not be altered for the proposed development. The existing concept plan may involve the construction of a secondary access road in proximity to the unclassified drain, which occurs near the existing driveway for the Kettle Creek Golf and Country Club.
Kettle Creek Conservation Authority (KCCA) Ontario Regulation 181/06 (Government of Ontario 2006b)	• Regulation issued under *Conservation Authorities Act,* R.S.O. 1990, Ontario Regulation 97/04. • Through this regulation, the KCCA has the responsibility to regulate activities in natural and hazardous areas (i.e., areas in and near rivers, streams, floodplains, wetlands, and slopes). The document outlines permitted uses and alterations within these regulated areas, as well as policies for management. • KCCA requires a scoping process for any development and site alteration proposals within the area of interference of wetlands. This scoping process is intended to assist with the formulation of the terms of reference for a scoped or comprehensive EIS.	• The majority of the subject property falls within the KCCA regulation limit. • River flood hazards are attributed to the watercourse found at the south and southeastern extent of the property limit. • A large flood fringe is identified on the subject property, identified through two-zone flood management within the former limits of the Village of Port Stanley. Floodway has also been identified in the study area, attributed to Kettle Creek to the east of the property.

Policy/Legislation	Description	Project Relevance
	• Section 2.0 of the Regulation identifies the general policies surrounding development, interference with wetlands, and alterations to shorelines and watercourses associated with the KCCA.	
The Official Plan of the County of Elgin (2015)	• Published in 2015, the Official Plan presents planning tools and strategies to guide the County of Elgin's growth and development. • Section D of the Official Plan addresses policies on natural heritage features, water, and natural hazards in the County. These are identified in Appendix Map 1. • Section D.1.2.6.b) indicates that "*Development and site alteration shall not be permitted in* *i) significant woodlands;* *ii) significant valleylands;* *iii) significant wildlife habitat and;* *iv) significant areas of natural and scientific interest* *unless it has been demonstrated through and Environmental Impact Study (EIS), that there will be no negative impacts on the natural features or their ecological functions."* • Appendix B identifies the required contents of an Environmental Impact Study. • Schedule A identifies tiered settlement areas. Sections B and C identify land use designations for the County. • Restrictions on development and site alteration are identified in relation to Watercourses in Section D.2.3, and in Natural and Man-made Hazards in Section D.3.3.	• Appendix Map 1 shows natural heritage features found in the County. Within the study area, natural heritage features include: ○ Significant Areas of Natural and Scientific Interest and ○ Woodlands. • Woodlands in the study area are to be considered significant as they are 10 hectares or greater, as indicated in Section D.1.2.2.1. • The EIS shall demonstrate that no negative impacts to these natural heritage features will occur.
Municipality of Central Elgin Official Plan (2022)	• Approved in 2022, the Official Plan presents policies to guide strategic growth within the Municipality of Central Elgin and identify natural heritage and water resources features for protection. • Section 2.6.1 outlines policies for the Natural Environment. Section 2.6.1.c) indicates: "Proposals for development and redevelopment shall be encouraged to identify and implement linkages between natural heritage features and areas, and ground and surface water features, to maintain or	• The study area occurs in the Urban Settlement Area. • Schedule A2 shows the presence of wooded areas in the subject property. The significance of the woodland and its boundary is to be established through the ISR and/or EIS. Section 3.1.1.2.f) outlines requirements for woodland conservation for plans of subdivision. • Natural Hazard Lands are identified on the subject property under Schedule G.

Policy/Legislation	Description	Project Relevance
	develop a diverse and connected natural heritage system." • Section 3.0 and Schedule A2 address natural heritage features within the Municipality.	• An ISR is also required to address natural features in the subject property and study area including Fish Habitat (Section 3.1.1.3.b.), Species at Risk (Section 3.1.1.4.a.), Areas of Natural and Scientific Interest (Section 3.1.1.5.c.), and Significant Wildlife Habitat (Section 3.1.1.6.).
Elgin County Woodlands Conservation By-Law 05-03 (County of Elgin 2005)	• The Elgin County Woodlands Conservation By-law came into effect in 2005, and outlines policies for the protection and proper management of trees and woodlands in the County. • The by-law states that no person, through their own actions or through any other person's actions, shall harvest, destroy, or injure any living tree unless the person who is harvesting, destroying, or injuring trees has done so in accordance with Good Forestry practices and within the Circumference Limit.	• The subject property includes areas of sloped woodland. As such, any tree removal on or near the sloped areas may require a permit from Elgin County under by-law 05-03.

4.0 Environmental Characterization

A preliminary site investigation was undertaken by NRSI staff on October 18, 2022. The investigation included a fall vegetation inventory, vegetation community mapping using the Ecological Land Classification (ELC) system (Lee et al. 1998), and a preliminary investigation for Significant Wildlife Habitat (OMNR 2015). The site investigation was conducted to identify natural features that may be impacted by the proposed development and gather general information about the subject property.

Map 1 illustrates the approximate subject property boundaries as well as mapped natural heritage features, based on the Land Information Ontario (LIO) mapping database. According to the information from Map 1, mapping available in the EOP (2015) and CEOP (2022), and mapping provided by the KCCA, the subject property contains portions of woodlands, a watercourse, and natural hazard lands (river flood hazards, flood fringe). A preliminary classification of vegetation communities within the study area are shown on Map 2.

4.1 Vegetation Communities

During the preliminary site visit, the subject property was characterized using Ecological Land Classification (ELC) mapping (Lee et al. 1998). A detailed fall vegetation survey was completed. Most of the subject property is characterized by an active golf course, with maintained lawn and hedgerows. Two small cultural plantations are found on the property, bordering larger deciduous forest and cultural woodland communities that extend into the study area. Preliminary mapping of these vegetation communities can be found on Map 2. A summary of ELC communities identified within the subject property is provided in Table 2.

Table 2. Vegetation Communities Identified within the Study Area

ELC Ecosite Type	ELC Description	Environmental Characteristics
Forest		
FOD5-2	Dry-Fresh Sugar Maple-Beech Deciduous Forest Type	In this deciduous forest community, the canopy and subcanopy are dominated by Sugar Maple *(Acer saccharum)* and American Beech *(Fagus grandifolia),* with lesser amounts of Shagbark Hickory (*Carya ovata*) and Black Cherry (*Prunus serotina*). Eastern Hop-hornbeam (*Ostrya virginiana*) is also present in the sub-canopy. Common shrubs include Multiflora Rose (*Rosa multiflora*) and Red Raspberry (*Rubus idaeus*). In the understorey layer, there is also significant regeneration of White Ash (*Fraxinus americana*) and Green Ash (*Fraxinus pennsylvanica*). The ground layer consists of invasive Garlic Mustard (*Alliaria petiolata)*, Blue-Stemmed goldenrod (*Solidago caesia*), and Dame's

		Rocket (*Hesperis matronalis)*. The community is relatively mature and has steep, variable topography.
FOD7	Fresh-Moist Lowland Deciduous Forest Type	The canopy of this deciduous forest is dominated by Black Walnut (*Juglans nigra).* Sugar Maple is also present. The sub-canopy includes young regenerating White Ash and invasive Common Buckthorn *(Rhamnus cathartica).* The understorey layer is relatively disturbed, comprising Common Buckthorn and Privet (*Ligustrum vulgare*). The groundcover includes Calico Aster *(Symphyotrichum lateriflorum)* and a variety of common grasses. In the canopy, many dead Ash (*Fraxinus* spp.) trees remain standing.
Thicket		
SWT2-2	Willow Mineral Thicket Swamp Type	A small swamp thicket is present near the eastern boundary of the subject property. Here, the canopy is dominated by Crack Willow *(Salix euxina).* The sub-canopy is highly disturbed, mainly comprised of invasive Common Reed *(Phragmites australis)* along with Sandbar Willow *(Salix interior)* and lesser amounts of Manitoba Maple *(Acer negundo).* In the understorey, Reed Canary Grass *(Phalaris arundinacea),* Canada Goldenrod *(Solidago canadensis),* Spotted Jewelweed (*Impatiens capensis),* and cattail (*Typha* spp.) are present. Many of these species are characteristic of wet soils. The groundcover layer includes Colt's foot (*Tussilago farfara*), Panicled Aster (*Symphyotrichum lanceolatum),* and Spotted Jewelweed.
Aquatic		
SAF1-3	Duckweed Floating-leaved Shallow Aquatic Type	This water body occurs within the FOD5-2 community in the study area. Aerial photo interpretation indicates that some submergent aquatic vegetation and a duckweed species (*Spirodela* sp.) are present within this feature.
OA	Open Aquatic	An unvegetated constructed pond is present within the gold course. The pond appears to have little to no submergent or floating vegetation. The shoreline of this feature is hardened and unsuitable for plant growth.
Cultural		
CUW1	Mineral Cultural Woodland Type	In this cultural woodland, the canopy is predominantly Black Walnut and Ash, most of which are dead or declining due to Emerald Ash Borer (*Agrilus planiplennis)* infestation. The sub-canopy includes White Ash, Bitternut Hickory *(Carya cordiformis),* and Virginia Creeper (*Parthenocissus quinquefolia).* In the understorey layer, Canada Goldenrod *(Solidago canadensis),* Multiflora Rose (*Rosa multiflora),* and Geulder Rose *(Viburnum opulus)* are present. The groundcover layer consists of Orchard Grass *(Dactylis glomerata),* Garlic Mustard, and Large-leaved Avens *(Geum macrophyllum)*.
CUP3-2	White Pine Coniferous Plantation Type	Eastern White Pine *(Pinus strobus)* is the dominant species in the various plantation communities on the subject property. The canopy also includes lesser amounts of American Elm (*Ulmus americana),* Common Pear (*Pyrus communis),* and Eastern Cottonwood (*Populus deltoides*). In the sub-canopy, Common

		Buckthorn, Black Cherry, and Riverbank Grape *(Vitis riparia)* are found. Shrubs include Pale Dogwood (*Cornus amomum*) and Geulder Rose *(Viburnum opulus)* and Privet *(Ligustrum vulgare).* There is also considerable growth of Canada Goldenrod in the understorey. The groundcover consists mostly of Garlic Mustard, Poison Ivy *(Toxicodendron radicans),* Calico Aster, and Creeping Charlie *(Glechoma hederacea).* These plantations comprise a large portion of the wooded features on the subject property.
CUM1-1	Dry-Moist Old Field Meadow Type	The cultural meadow has a sparse canopy of Eastern Cottonwood. The sub-canopy consists of Black Willow *(Salix nigra),* Common Buckthorn, Eastern Cottonwood, and White Spruce *(Picea glauca).* In the understorey, meadow species such as Tall Goldenrod *(Solidago gigantea),* Grass-leaved Goldenrod *(Euthamia graminifolia),* Reed Canary Grass, and Staghorn Sumac *(Rhus typhina)* are present. In addition to these species, Virginia Creeper is also abundant in the groundcover layer. This community, where present on the subject property, is narrow and linear.
CUT1-5	Raspberry Cultural Thicket Type	A small, narrow Raspberry Cultural Thicket community is found within the deciduous forest at the western extent of the subject property. It is dominated by Red Raspberry and has sparse to no canopy or subcanopy.
CUT1-1	Sumac Cultural Thicket Type	This small community is considered an inclusion within the Eastern White Pine Coniferous Plantation. It is dominated by Staghorn Sumac.

4.2 Vascular Flora

Background information from the NHIC database indicates that 6 rare plant species are reported from within 1km of the study area. These species are SAR, SCC, or considered Rare in the County of Elgin. The SAR screening (Appendix II) identifies that suitable habitat for 3 of these species may be present within the study area: Butternut, American Ginseng, and Broad Beech Fern. During 2018 vegetation surveys completed on the adjacent property, several Butternuts were found, and thus this species has a higher likelihood of occurring on the subject property. The latter two species are not expected to occur, and were not detected on the subject property during the preliminary site visit. Additional vegetation inventories will be required to confirm species absence. These species, their current status ranks, and preferred habitats are available in Appendix IV.

4.3 Aquatic Habitat

Base mapping identified the presence of a permanent watercourse within the subject property (Map 1). The watercourse is described as Not Rated, according to mapping by the Ontario Ministry of Agriculture Food and Rural Affairs (OMAFRA). An intermittent watercourse is also

found in the southwest corner of the subject property, extending south down the slope to the municipal drain (Map 1). This municipal drain generally flows from southwest to northeast, running along the edge of the southwestern off-property woodland towards the south boundary of the study area. The drain bends and runs east between the off-property southern agricultural field and the Kettle Creek Golf and Country Club.

An aquatic habitat assessment was conducted immediately south of the subject property by NRSI biologists in 2016, as described in the Seaglass in Port Stanley Scoped EIS (NRSI 2018). At this time, fish were observed upstream of this neighbouring drain. In downstream reaches, no fish were observed and limited aquatic habitat was present. The upstream half of the assessed watercourse, which occurs just south of the subject property, is undergoing erosion and bank scour as a result of low density vegetation on the banks. The downstream portion of the channel contains dense vegetation and the channel appears to be more stable. The channel bed consists of sands and silt with limited amount of pebbles and cobbles. Water temperatures taken at various locations along the southern drain were indicative of a cool or coldwater system. A detailed aquatic assessment may be required to accurately characterize drains that occur within the subject property.

4.4 Natural Hazard Lands

Schedule G2 of the CEOP (2022) identifies Natural Hazards within the Community of Port Stanley. This mapping indicates that the riverine flood hazard limit and flood fringe for Kettle Creek is located within the subject property. Flooding hazards also occur along the length of the municipal drain that runs through the property. Schedule G of the CEOP (2022) shows natural hazards mapped within woodlands along the western half of the subject property, and towards the southeastern-most extent. These hazards are expected to be associated with steep slopes found within the woodlands.

5.0 Significance, Sensitivity, and Function

As detailed above, the study area contains of a variety of aquatic and terrestrial features and functions. Features within the study area also require assessment of significance under the County of Elgin Official Plan (2015) and Municipality of Central Elgin Official Plan (2022). The following is a summary of the significance and sensitivity of the natural features within the study area, including how they fit into the larger subwatershed and landscape fabric, and how the natural heritage policies and legislation described in Section 2.0 inform the identification of constraints for the proposed development. This analysis is intended to guide the location of the proposed development and to avoid or minimize impacts to significant and sensitive natural features and their ecological functions.

5.1 Woodlands

Woodlands are mapped to occur within the subject property, as shown in Schedule A2 of the CEOP (2022) and Appendix #1 of the EOP (2015). As indicated in the CEOP (2022), "…*for the purposes of this Plan all woodlands greater than 2 hectares in size are considered significant*."

In Section D1.2.2.1 of the EOP (2015), "*Elgin County considers woodlands 10 hectares or greater as significant woodland. Woodlands between 2 hectares and 10 hectares are also significant if they are located within 30 metres of the boundary of a significant natural heritage feature (e.g. significant wetland, significant valleyland, fish habitat and/ or watercourses).*"

All woodland features identified in the subject property extend into the study area in contiguous parcels greater than 10ha in size, and thus may be considered significant under the CEOP (2022) and EOP (2015). Map 3 shows these expected Significant Woodlands. Under the EOP (2015), site alteration is not permitted within these woodland features unless it is demonstrated by an EIS that there will be no negative impacts on the feature or its ecological function. The EOP (2015) also states that development and site alteration should not be permitted in any adjacent lands (defined as 120m from the boundary of the significant woodland), unless it is demonstrated through an EIS that there will be no negative impacts on these lands or their ecological function.

5.2 Significant Wildlife Habitat

Based on the results of a comprehensive background review, desktop analysis, and a preliminary site visit, 11 candidate SWH types were identified within the subject property (Appendix III). Field surveys are required to confirm or dismiss the candidate SWH types. A

Terms of Reference for an EIS is provided in Appendix I, which includes surveys to assess the candidate SWH types identified. The candidate SWH types identified through the screening process to possibly occur within the subject property include:

- Bat Maternity Colonies
- Turtle Wintering Area
- Reptile Hibernaculum
- Migratory Butterfly Stopover Areas
- Landbird Migratory Stopover Areas
- Woodland Raptor Nesting Habitat
- Turtle Nesting Areas
- Amphibian Breeding Habitat (Woodland)
- Amphibian Breeding Habitat (Wetland)
- Special Concern and Rare Wildlife Species
- Amphibian Movement Corridors

A background information request has been submitted to the MNRF. Available information will be incorporated into further assessment of the above listed SWH types as part of the EIS.

5.3 Habitat of Endangered and Threatened Species

The County of Elgin Official Plan (2015) stipulates that:

> *The significant habitat of endangered species and threatened species will be based on an evaluation of the following considerations:*
>
> *a) assessments reviewed and approved by the Ministry of Natural Resources regarding the extent of the species' habitat;*
>
> *b) habitats or areas delineated by MNR and/ or regulated under the ESA; and,*
>
> *c) habitat that is necessary for the maintenance, survival, and/or the recovery of naturally occurring or reintroduced populations of endangered species or threatened species, and where those areas of occurrence are occupied or habitually occupied by the species during all or any part(s) of its life cycle.*

Based on background information collected from the various wildlife atlases, 17 Endangered and Threatened species are reported from the vicinity of the study area. Potential habitat for 8 of these species was identified within the subject property by comparing the results of

preliminary vegetation community mapping to the habitat requirements for each of these species outlined in the SWHTG (OMNR 2000 Appendix G). Endangered and Threatened Species that have the potential to occur on the subject property include:

- Wood Thrush
- Red-headed Woodpecker
- Eastern Meadowlark
- Eastern Small-footed Myotis
- Northern Myotis
- American Badger (Southwestern Ontario population)
- Butternut
- American Ginseng

The EIS Terms of Reference (Appendix I) provides details on field surveys that will be conducted to confirm the presence of these species.

5.4 Aquatic Habitat

The study area contains several municipal drains that may provide aquatic habitat.

As seen in Section 2.2. of the Policies and Procedures for the Administration of Section 28 Regulations, "*The Authority has the power to grant or deny permission for any straightening, changing, diverting or interfering in any way with the existing channel of a river, creek, stream, lake or watercourse or interfere in any way with a wetland within the area of its jurisdiction*." Further aquatic habitat assessments are required to classify these drains. Details of these surveys are provided in the Terms of Reference in Appendix I.

5.5 Lower Kettle Creek Subwatershed

The subject property is located within the Lower Kettle Creek subwatershed, which drains an approximate area of 330 km^2 (Aquaresource Inc. 2009). The subwatershed begins at the confluence of Kettle Creek and Dodd Creek and empties into Lake Erie at Port Stanley. As indicated in the Integrated Water Budget Report for this watershed (Aquaresource Inc. 2009), Lower Kettle Creek is the last subwatershed to discharge into Kettle Creek before it empties into Lake Erie. It is characterized by high variability in surficial materials, high amounts of groundwater recharge and inflow, and a relatively high level of water demand compared to neighbouring subwatersheds.

As outlined in the Watershed Report Card (KCCA 2018), this watershed contains poor surface water quality as a result of "fertilizers, pesticides, sedimentation and erosion, heavy metals, petroleum products and chemicals." High phosphorus contributions are a key threat to surface water quality in this watershed. Fertilizers are commonly used in golf course operations, and are likely a contributing source to the documented pollution. It is important that impacts to the entire subwatershed, particularly aquatic impacts to Kettle Creek, are avoided as much as feasible.

5.6 Wetlands

The preliminary site investigation identified the presence of wetlands and ponds within the subject property and study area. These include a small Willow Mineral Swamp Thicket (SWT2-2) community at the northeastern extent of the subject property and a small Duckweed Shallow Aquatic (SAS-1) feature to the northwest of the property. The subject property contains a large constructed pond located centrally on the golf course. This pond is bisected by a golfcart path, is unvegetated, and contains a hardened stone shoreline. A small pond is also located within the Willow Mineral Swamp Thicket community. These wetlands have not been identified to be locally or provincially significant under Schedule A2 of the CEOP (2022) or Appendix 1 of the EOP (2015).

Wetland features regulated by the KCCA under KCCA Ontario Regulation 181/06 must meet the following criteria, as defined by Government of Ontario (2006b):

a) *Is seasonally or permanently covered by shallow water, or has a water table close to or its surface;*
b) *Directly contributes to the hydrological function of a watershed through connection with a surface watercourse;*
c) *Has hydric soil, the formation of which has been caused by the presence of abundant water; and*
d) *Has vegetation dominated by hydrophytic plants or water tolerant plants, the dominance of which has been favoured by the presence of abundant water.*

Wetlands on the subject property should be evaluated against these criteria in order to determine if Ontario Regulation 181/06 applies. If these features are determined to be "wetlands," Section 5 of Ontario Regulation 181/06 will be in effect: "*Subject to section 6, no person shall straighten, change, divert or interfere in any way with the existing channel of a*

river, creek, stream or watercourse or change or interfere in any way with a wetland" (Government of Ontario 2006a).

Section 7.S.4.A.c. of the Policies and Procedures for the Administration of Section 28 Regulations (Government of Ontario 2006b) applies to non-significant wetlands less than 2ha in size, as found on the subject property: "*Except as provided for in Policies 4.4 (5.) A. (a) and 4.4 (5.) A (b), no new development or site alteration is permitted within 15 metres of Other wetlands less than 2 hectares in size."* Any development proposed within 15-30m of these limits will require a hydrological assessment to determine whether any negative impacts will occur.

6.0 Potential Cumulative Effects and Impacts

Several potential effects and impacts have been identified based on a review of the draft concept plan, a preliminary site investigation, background information and mapping. The following is a brief description of anticipated constraints, potential cumulative effects, and potential impacts based on the preliminary concept plan (Appendix V). The concept plan is subject to change based on findings of background and natural heritage studies. The following information will be used to scope the EIS (see Appendix I) and identify areas of potential conflict between the proposed development and existing natural features and habitats.

6.1 Potential Cumulative Effects

Additional developments are planned for the lands to the south and north of the property, which are zoned as residential lands. Should these lands be developed in conjunction with the proposed development on the subject property, there would be additional pressure on the natural heritage features that surround them. Potential cumulative effects from the development of all these lands may include:

- Increases in human activity within the significant woodlands and other woodlands, Introduction of invasive and prolific species into the wooded areas,
- Increased surface water runoff to the watercourses and drains nearby, including the municipal drain within the subject property,
- Decreased groundwater infiltration and therefore coldwater baseflow contributions to watercourses, drains, and the Kettle Creek watershed,
- Increased flashiness of local hydrographs and potential flooding concerns for Kettle Creek, and
- Potential reduction in wildlife habitat.

These and other potential impacts within the subject property are discussed further below. Once detailed information is available, a thorough review of impacts from the proposed undertaking will be conducted and the results presented in the EIS.

6.2 Potential Impacts

6.2.1 Woodlands

Woodland features on the subject property are considered significant under the CEOP (2022). A buffer is required from the edge of a significant woodland and protection of the woodland is required during construction to avoid injuring or harming trees and wildlife habitat. The

proposed development footprint occurs outside of the boundary of these woodlands. The woodlands shall be delineated and a buffer shall be applied through the EIS.

Impacts to the woodlands may include direct, indirect, or induced impacts such as:

- Changes in topography and surface water runoff, and compaction of soils from grading activities,
- Injury to trees or their root systems from construction activities,
- Changes in vegetation communities due to dust, and
- Encroachment into the significant woodlands from human activity.

Recommendations for buffers, mitigation, compensation, and protection during and after construction will be detailed in the EIS.

6.2.2 Wildlife Habitat

Sections 5.2 and 5.3 of this report discusses SWH and habitat of endangered and threatened species. A total of 11 candidate SWH types have been identified through the screening process, along with potential habitat for 14 SAR and SCC. The EIS will include field surveys to confirm the SWH present within the subject property, as well as investigate the presence of SAR and SCC. Habitat for SAR must be protected during and after construction. Enhancement opportunities may be present and will be discussed in the EIS. Potential impacts to wildlife habitat include:

- Bird nest destruction,
- Burrow and den destruction,
- Tree and vegetation removal,
- Temporarily increased noise and dust from construction activities,
- Artificial lighting, and
- Increased human activity within the significant woodlands, including unauthorized trails.

Each of these potential impacts will be discussed in the EIS when detailed information regarding the proposed undertaking is available.

6.2.3 Natural Hazard Areas

Natural hazard areas have been identified within the subject property through the CEOP and include steep slopes and flood fringe areas for Kettle Creek. The proposed residential lots have

been located outside of the flood fringe as mapped in Schedule G2 of the CEOP (2022). The EIS will include details from any geotechnical slope stability assessments completed within steep woodland features to evaluate the potential impacts to natural hazards.

6.2.4 Aquatic Habitat

A setback to the municipal drain is expected to be required for maintenance works, as well as flooding and potential erosion. This setback will provide enhancement opportunities for the riparian area and aquatic habitat within the drain. Potential impacts to the drain from the proposed undertaking may include:

- Changes to surface water and groundwater inputs due to grading and stormwater management controls,
- Changes to water quality from the use of pesticides and fertilizers on rear yards backing onto the drain,
- Sedimentation and erosion during and after construction,
- Sedimentation and changes to vegetation communities from dust, and
- Increased human activity within the buffer and the drain (e.g. fishing, unauthorized trails, dumping and debris).

Buffers, mitigation measures, and enhancement opportunities will be discussed in the EIS (see Appendix I).

7.0 Data Gaps and Next Steps

Based on the findings described above, a Terms of Reference for an EIS was prepared by NRSI. The Terms of Reference is attached as Appendix I. The TOR will be submitted to the Municipality of Central Elgin, County of Elgin, and KCCA for approval.

Background information requests have been sent to the KCCA, MECP, and the MNRF to gather data regarding natural features, habitats, and wildlife present within and adjacent to the subject property. At this time, a response from KCCA has been received, which identified that the regulation limits and flood hazards present on the property. A response from the MECP has also been received, identifying SAR that have been reported from the vicinity of the study area.

No additional information was available from the KCCA. No response has yet been received from the MNRF.

Based on the background review to date, the following is a list of data gaps and areas for further investigation. The methods for field surveys and proposed timing have been provided in the EIS Terms of Reference.

- Detailed vegetation inventory for sensitive species;
- Surveyed woodland driplines;
- Surveyed wetland boundaries;
- Breeding birds habitat;
- Turtle habitat;
- Butterfly habitat;
- Anuran breeding habitat;
- Cavity trees and habitat for bats;
- Aquatic habitat characterization;
- SAR and SCC present within the subject property;
- Candidate or Possible SWH within the subject property; and
- Details regarding the proposed undertaking, including stormwater management controls and facility design, grading, tree and vegetation removal, etc.

The majority of these information gaps can be addressed through field surveys conducted by NRSI, as detailed in the EIS Terms of Reference. A Functional Servicing and Stormwater Management Report may be required to assess the impacts to the natural features within the subject property, particularly if outlets from storm sewers or stormwater management ponds will

be directed towards the municipal drain. The remaining information will be gathered from the proponent as the concept plan moves forward.

8.0 Summary

NRSI was retained by Monteith Brown Planning Consultants to complete an ISR and TOR in support of a proposed residential development at the Kettle Creek Golf and Country Club at 320 Carlow Road, Port Stanley, Ontario. The subject property is located within the Municipality of Central Elgin, County of Elgin and contains an active golf course, a wetland, a pond, and treed areas. The subject property is surrounded by wooded areas, agricultural lands, and active construction of adjacent subdivisions.

Based on a background review of available information, a total of 13 SAR and SCC have been identified to have potential suitable habitat in the study area. Eleven possible SWH types have also been identified. The subject property also contains fish habitat, wetlands, woodland features, and natural hazard lands. Woodlands on the subject property may be considered significant under the CEOP (2022) and EOP (2015). Wetlands and natural hazard features on the subject property are regulated by the KCCA under Ontario Regulation 181/06.

The attached Terms of Reference outlines the proposed field program for evaluating the significance of natural features and habitats that may occur on the subject property. The findings of this program will inform the layout of the site plan with the intention of protecting sensitive natural features and habitats. An EIS will be developed to characterize natural features, evaluate the significance of these features, identify any environmental impacts of the proposed undertaking, and propose mitigation strategies to reduce these impacts.

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Appendix I
Terms of Reference

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

February 2, 2023 2982

Kevin McClure
Planner
Planning and Building Services, City of St. Thomas – Central Elgin
9 Mondamin Street
St. Thomas, ON N5P 2T9

Paul Hicks
Planner
County of Elgin Planning Services
450 Sunset Drive
St. Thomas, ON N5R 5V1

c/o Joe Gordon
Manager of Planning and Development
Kettle Creek Conservation Authority
44015 Ferguson Line
St. Thomas, ON N5P 3T3

RE: Kettle Creek Golf Course
Environmental Impact Study - Terms of Reference

On behalf Natural Resource Solutions Inc. (NRSI), I am pleased to provide the following Terms of Reference (TOR) for an Environmental Impact Study (EIS) and Tree Inventory and Protection Plan (TIPP) for a proposed residential redevelopment of an existing golf course known as the Kettle Creek Golf and Country Club in Port Stanley, Ontario (the 'subject property,' Map 1).

This TOR has been prepared in consideration of Ontario Regulation 181/06 (Government of Ontario 2006a), the Kettle Creek Conservation Authority's (KCCA) Policies and Procedures for the Administration of Section 28 Regulations (Government of Ontario 2006b), the Municipality of Central Elgin Official Plan (2022), and the County of Elgin Official Plan (2015). The TOR accompanies the Issues Scoping Report (ISR) required by the Municipality of Central Elgin Official Plan (2022).

Project Background

NRSI has been retained by Monteith Brown Planning Consultants on behalf of landowner James Glover (the Proponent) to complete an EIS and TIPP for the proposed residential development. The proposed undertaking will consist of single detached lots, townhouse blocks, roads, and stormwater management ponds. Some existing land will be retained for golf course use.

This TOR outlines the steps required to complete the EIS and TIPP for the proposed development, and consists of three phases:

- Background information review;
- Natural resource characterization, and;

- EIS and TIPP reporting.

Each of these components is described in separate sections within this letter. Though portions of team reports are discussed herein, recognize that engineering and hydrogeological reports are to be completed under separate cover by separate team members.

Project Scoping

The proposed EIS and TIPP will provide background information, methods and findings of field surveys, and a variety of impact analyses that rely on a pre-defined set of geographical terms. This section aims to clarify important terms that will be used throughout both reports.

The term *development area* refers to the location where construction will be required to facilitate the proposed development. The term *subject property* refers to the legal lands owned by the proponent. The term *study area* refers to the subject property and lands within 120m, and connected natural features beyond this 120m boundary (Map 1). Refer to the ISR for detailed descriptions of these terms.

Legacy data will be collected from several atlases, which is available in 10x10km grids, as well as the Natural Heritage Information Centre (NHIC) database, which is available in 1x1km grids (MNRF 2022). These areas are referred to where necessary by their applicable grid. Information will be compiled from the 10x10km atlas square that overlaps the subject property (square 17MH81). Legacy data is available from NHIC within the 1x1km atlas square overlapping the subject property (square 17MH8124).

1. Background Information Review

NRSI has reviewed policies and legislation to inform this EIS. Detailed below are the relevant policy areas that will be considered during the development of the EIS.

Table 1. Relevant Policies and Legislation

Policy/Legislation	Description	Project Relevance
Provincial Policy Statement (OMMAH 2020)	• Issued under the authority of Section 3 of the Planning Act and came into effect on May 1, 2020, replacing the 2014 PPS (OMMAH 2014). • One of the key goals of the PPS is to "[*provide*] *for appropriate development while protecting resources of provincial interest, public health and safety, and the quality of the natural and built environment."* • Section 2.1 of the PPS – Natural Heritage establishes clear direction on the adoption of an ecosystem approach and the protection of resources that have been identified as 'significant'. This section also identifies that natural features are to be protected for the long term. • Section 2.1.5 of the PPS identifies that development and site alteration shall not be permitted within the area outlined in sub-sections a) – f) *"unless*	• Based on the background review, preliminary site visit, SWH screening, and SAR/SCC screening, several natural features afforded consideration within the PPS have been identified to possibly occur in the study area, including: o Fish Habitat; o Significant Wildlife Habitat; and o Habitat for Endangered and Threatened Species • Significant Areas of Natural and Scientific Interest (ANSI) are also identified to occur just outside of the study area boundary. This Earth Science ANSI is described as the Port Stanley Till.

Policy/Legislation	Description	Project Relevance
	it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions." • The Natural Heritage Reference Manual (OMNR 2010) and the Significant Wildlife Habitat Technical Guide (OMNR 2000) were prepared by the MNRF to provide guidance on identifying natural features and in interpreting the Natural Heritage sections of the PPS.	• The PPS indicates that development or site alteration shall not be permitted within these features unless it has been demonstrated that there will be no negative impacts on the features or their ecological functions. • The EIS shall demonstrate that no negative impacts to these features will occur.
Endangered Species Act (Government of Ontario 2007)	• The original ESA, written in 1971, underwent a year-long review which resulted in a number of changes which came into force in 2007. • The ESA prohibits killing, harming, harassing, or capturing Endangered or Threatened and protects their habitats from damage and destruction. • In order to balance social and economic considerations with protection and recovery goals, the ESA also enables the MNRF to issue permits or enter into agreements with proponents in order to authorize activities that would otherwise be prohibited by subsections 9(1) or 10(1) of the Act provided the legal requirements of the Act are met.	• Based on information available through background documents and field surveys, including the SAR/SCC screening, several SAR were identified as potentially having suitable habitat within the study area. • The EIS shall demonstrate that no negative impacts to SAR will occur.
Species at Risk Act (SARA, Government of Canada 2002)	• SARA establishes the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as an independent body of experts responsible for assessing and identifying species at risk. • The SARA creates prohibitions to protect listed threatened and endangered species and their critical habitat.	• Any observed species listed by COSEWIC as endangered or threatened shall be protected, along with their habitat. • The EIS shall demonstrate that no impacts to SAR will occur.
Migratory Birds Convention Act (Canadian Wildlife Service (CWS) 2017)	• The MBCA protects migratory game birds, insectivorous birds, and several other migratory non-game birds from persecution in the form of harassment. • The schedule of on-site work must consider MBCA windows, with timing of breeding bird season typically occurring between May 1 and July 31, however, this is a guideline, since the MBCA applies to nesting bird species. • "Incidental take" is considered illegal, with the exception of a permit obtained by the CWS.	• The timing of construction activities, especially vegetation clearing and site grading must have consideration for the MBCA timing windows.

Policy/Legislation	Description	Project Relevance
Fish and Wildlife Conservation Act (Government of Ontario 2019)	• The FWCA provides protection for certain bird species, not protected under the MBCA (e.g., raptors), as well as furbearing mammals and their dens or habitual dwellings, asides from the Red Fox (*Vulpes vulpes*) and Striped Skunk (*Mephitis mephitis*).	• The timing of construction activities, especially vegetation clearing and site grading must have consideration for bird nesting and den sites for fur-bearing mammals.
The Canadian *Fisheries Act* (Government of Canada 1985)	• Last amended in August 2019, the federal Fisheries Act provides for the protection of fish and fish habitat • Fish are protected through two core prohibitions: Section 34.4(1) prohibits the death of fish by means other than fishing, and Section 35(1) prohibits the harmful alteration, disruption, or destruction (HADD) of fish habitat (Government of Canada 2019). • Fish habitat is defined as “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”.	• The municipal drains on and adjacent to the subject property provide direct fish habitat. • The need for project review by the Department of Fisheries and Oceans (DFO) Fish and Fish Habitat Protection Program (FFHPP) will be determined upon the completion of a proponent-led assessment of whether the proposed undertaking can meet all measures to protect fish and fish habitat (as outlined in the DFO’s online Projects Near Water guidelines). • Should the proponent-led assessment indicate that impacts to fish and fish habitat may occur as a result of the proposed development, project review by the DFO will be necessary to determine if the proposed undertaking has the potential to contravene the Fisheries Act, and if an Authorization under the Act will be required.
Ontario Drainage Act (Government of Ontario 2021)	• The Act provides legislation and policies for the creation, maintenance, and repair of municipal drains in Ontario. • DFO‟s drain classification system includes 7 categories that help to simplify the review and approval process for municipal drain works.	• The various constructed drains, including the Lake Road and Marr municipal drains, that occur on the subject property are not rated by the DFO. • The open channel Marr drain occurs to the northeast of the subject property and will not be altered for the proposed development. The existing concept plan may involve the construction of a secondary access road in proximity to the unclassified drain, which occurs near the existing driveway for the Kettle Creek Golf and Country Club.

Policy/Legislation	Description	Project Relevance
Kettle Creek Conservation Authority (KCCA) Ontario Regulation 181/06 (Government of Ontario 2006b)	• Regulation issued under *Conservation Authorities Act,* R.S.O. 1990, Ontario Regulation 97/04. • Through this regulation, the KCCA has the responsibility to regulate activities in natural and hazardous areas (i.e., areas in and near rivers, streams, floodplains, wetlands, and slopes). The document outlines permitted uses and alterations within these regulated areas, as well as policies for management. • KCCA requires a scoping process for any development and site alteration proposals within the area of interference of wetlands. This scoping process is intended to assist with the formulation of the terms of reference for a scoped or comprehensive EIS. • Section 2.0 of the Regulation identifies the general policies surrounding development, interference with wetlands, and alterations to shorelines and watercourses associated with the KCCA.	• The majority of the subject property falls within the KCCA regulation limit. • River flood hazards are attributed to the watercourse found at the south and southeastern extent of the property limit. • A large flood fringe is identified on the subject property, identified through two-zone flood management within the former limits of the Village of Port Stanley. Floodway has also been identified in the study area, attributed to Kettle Creek to the east of the property.
The Official Plan of the County of Elgin (2015)	• Published in 2015, the Official Plan presents planning tools and strategies to guide the County of Elgin's growth and development. • Section D of the Official Plan addresses policies on natural heritage features, water, and natural hazards in the County. These are identified in Appendix Map 1. • Section D.1.2.6.b) indicates that "*Development and site alteration shall not be permitted in* *i) significant woodlands;* *ii) significant valleylands;* *iii) significant wildlife habitat and;* *iv) significant areas of natural and scientific interest* *unless it has been demonstrated through and Environmental Impact Study (EIS), that there will be no negative impacts on the natural features or their ecological functions."* • Appendix B identifies the required contents of an Environmental Impact Study. • Schedule A identifies tiered settlement areas. Sections B and C identify land use designations for the County.	• Appendix Map 1 shows natural heritage features found in the County. Within the study area, natural heritage features include: o Significant Areas of Natural and Scientific Interest and o Woodlands. • Woodlands in the study area are to be considered significant as they are 10 hectares or greater, as indicated in Section D.1.2.2.1. • The EIS shall demonstrate that no negative impacts to these natural heritage features will occur.

Policy/Legislation	Description	Project Relevance
	• Restrictions on development and site alteration are identified in relation to Watercourses in Section D.2.3, and in Natural and Man-made Hazards in Section D.3.3.	
Municipality of Central Elgin Official Plan (2022)	• Approved in 2022, the Official Plan presents policies to guide strategic growth within the Municipality of Central Elgin and identify natural heritage and water resources features for protection. • Section 2.6.1 outlines policies for the Natural Environment. Section 2.6.1.c) indicates: "Proposals for development and redevelopment shall be encouraged to identify and implement linkages between natural heritage features and areas, and ground and surface water features, to maintain or develop a diverse and connected natural heritage system." • Section 3.0 and Schedule A2 address natural heritage features within the Municipality.	• The study area occurs in the Urban Settlement Area. • Schedule A2 shows the presence of wooded areas in the subject property. The significance of the woodland and its boundary is to be established through the ISR and/or EIS. Section 3.1.1.2.f) outlines requirements for woodland conservation for plans of subdivision. • Natural Hazard Lands are identified on the subject property under Schedule G. • An ISR is also required to address natural features in the subject property and study area including Fish Habitat (Section 3.1.1.3.b.), Species at Risk (Section 3.1.1.4.a.), Areas of Natural and Scientific Interest (Section 3.1.1.5.c.), and Significant Wildlife Habitat (Section 3.1.1.6.).
Elgin County Woodlands Conservation By-Law 05-03 (County of Elgin 2005)	• The Elgin County Woodlands Conservation By-law came into effect in 2005, and outlines policies for the protection and proper management of trees and woodlands in the County. • The by-law states that no person, through their own actions or through any other person's actions, shall harvest, destroy, or injure any living tree unless the person who is harvesting, destroying, or injuring trees has done so in accordance with Good Forestry practices and within the Circumference Limit.	• The subject property includes areas of woodland. As such, any tree removal on or near the sloped areas may require a permit from Elgin County under by-law 05-03.

Collection and Review of Background Information

NRSI has already completed the majority of this stage to inform the ISR and TOR. Existing background information has been collected for the 10x10km grid overlapping the subject property, as described above. Existing studies with natural environment components have been reviewed and are listed below. Background sources reviewed include the following:

- Natural Heritage Information Centre (NHIC) (MNRF 2022a);

- Natural Heritage Reference Manual (MNRF 2010);
- Significant Wildlife Habitat Technical Guide (OMNR 2000);
- Significant Wildlife Habitat Criteria Schedules For Ecoregion 7E (MNRF 2015);
- Ontario Mammal Atlas (Dobbyn 1994);
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2019);
- Ontario Butterfly Atlas (Macnaughton et al. 2022);
- Ontario Odonata Atlas (MNRF 2022b);
- Ontario Breeding Bird Atlas (Bird Studies Canada (BSC) et al. 2006);
- Ministry of Environment, Conservation and Parks (MECP) Species at Risk;
- Government of Canada Species at Risk Act (SARA) Registry (2022);
- Department of Fisheries and Oceans (DFO) Aquatic Species at Risk mapping (DFO 2022);
- Aquatic Resource Area (ARA) Data (Government of Ontario 2020);
- Municipality of Central Elgin Official Plan (Municipality of Central Elgin 2022); and
- County of Elgin Official Plan (Elgin County 2015).

Initial wildlife species lists for the study area were developed using these background sources. To inform the TOR, NRSI biologists also completed a preliminary vegetation survey and significant wildlife habitat search throughout the subject property. A preliminary delineation of vegetation communities is shown on Map 2. Based on available background information, and results from these preliminary field surveys, a digital screening exercise was completed for potential Species at Risk (SAR), and Species of Conservation Concern (SCC) (see ISR Appendix II), as well as potential Significant Wildlife Habitat (SWH) (see ISR Appendix III) within the subject property and study area.

The SAR and SCC screening exercise identified a preliminary list of species that may have suitable habitat within the subject property. This screening is also informed by information provided by the MECP. A list of species that may have suitable habitat on the subject property, as well as the proposed surveys to properly assess their presence, is provided below.

- Eastern Wood-pewee (*Contopus virens*) – Breeding bird surveys;
- Barn Swallow (*Hirundo rustica*) – Breeding bird surveys;
- Wood Thrush (*Hylocichla mustelina*) – Breeding bird surveys;
- Red-headed Woodpecker (*Melanerpes erythrocephalus*) – Breeding bird surveys;
- Eastern Meadowlark (*Sturnella magna*) – Breeding bird surveys;
- Snapping Turtle (*Chelydra serpentina*) – Turtle basking surveys;
- Woodland Vole (*Microtus pinetorum*) – Area search for suitable habitat;
- Eastern Small-footed Myotis (*Myotis leibii*) – Bat habitat assessment and tree inventory;
- Northern Myotis (*Myotis septentrionalis*) – Bat habitat assessment and tree inventory;

- American Badger (Southwestern Ontario population) (*Taxidea taxus jacksoni*) – Area search for suitable habitat;
- Monarch (*Danaus plexippus*) – Butterfly survey;
- Butternut (*Juglans cinerea*) – Vegetation survey and tree inventory;
- American Ginseng (*Panax quinquefolius*) – Vegetation survey;
- Broad Beech Fern (*Phegopteris hexagonoptera*) – Vegetation survey;

The SWH screening exercise identified a preliminary list of candidate SWH (OMNR 2000; MNRF 2015) that may be present on the subject property and in the study area, and which will be assessed through the proposed field program. A list of potential habitats within the subject property, as well as the proposed surveys to properly assess their presence, is provided below.

- Bat Maternity Colonies – Bat habitat assessments;
- Turtle Wintering Area – Turtle basking surveys;
- Reptile Hibernaculum – Terrestrial habitat assessments and documentation;
- Migratory Butterfly Stopover Areas – Butterfly surveys;
- Landbird Migratory Stopover Areas – Breeding bird surveys;
- Amphibian Breeding Habitat (Woodland) – Anuran call surveys;
- Amphibian Breeding Habitat (Wetland) – Anuran call surveys;
- Terrestrial Crayfish Habitat – Terrestrial habitat assessments and documentation;
- Special Concern and Rare Wildlife Species – Detailed by species listed above; and
- Amphibian Movement Corridors – Anuran call surveys.

2. Natural Resource Characterization

This phase includes all three-season field surveys, as well as a preliminary analysis of field survey data to inform the development plan, including setbacks, buffers, and natural heritage constraints.

Terrestrial Field Surveys

Vegetation Inventory and ELC Mapping

A three-season vegetation inventory will be completed for the subject property. The first vegetation inventory was completed in the fall of 2022, concurrent with vegetation community classification following the Ecological Land Classification (ELC) system for southern Ontario (Lee et al. 1998). Details on the vegetation communities were recorded, including species composition, dominance, uncommon species or features, surficial soil types, and evidence of human impact. Two subsequent visits will be completed in the spring and summer 2023 to complete a more fulsome analysis as other seasonal plants emerge. The subject property and immediately adjacent habitats will be systematically searched for plant species and any rare species will be documented and georeferenced, as access allows. Vascular flora species will be recorded by ELC polygon.

Breeding Bird Surveys

Breeding bird surveys are recommended to identify the presence of SAR birds that may by utilizing the subject property. Two early morning breeding bird surveys will be carried out according to the Ontario Breeding Bird Atlas methodology during peak breeding season (late May to early July, 2023). One survey will be carried out during the spring migratory window to document the use of the property by migratory birds (as per Appendix B, County of Elgin OP).

Wetland Delineation

Following the Ontario Wetland Evaluation System (OWES) (MNRF 2014), NRSI staff will flag the boundaries of any wetlands found within the subject property, or with the potential to impact the proposed site plan. Final mapping will be provided to the KCCA for their records. This delineation will be confirmed by KCCA staff and used to inform mitigation and constraints in the EIS.

Anuran Call Surveys

Due to the presence of wetlands and ponds within the subject property and study area, anuran call surveys will be required to document the presence of breeding toads and frogs on the property. Three calling anuran surveys will be conducted between April and June 2023 (in the second half of each month) at select monitoring stations. Surveys will be conducted after dusk and will document all calling anuran species, including a call code and estimated number of individuals following methods outlined in the Marsh Monitoring Program (Bird Studies Canada 2009).

Turtle Basking Surveys

Turtle visual encounter surveys will be completed within the subject property to determine if turtle overwintering SWH or habitats of the SCC Snapping Turtle are present. A minimum of five surveys will be completed between ice-off in the spring and June 15th in accordance with the MNRF Survey Protocol for Blanding's Turtle in Ontario (MNRF 2015a), which is suitable for all turtle species. Surveys completed earlier in the survey period will assess the presence of overwintering habitats and those conducted in May and June will determine the presence of summer habitats. Point counts will be established at open water habitats. Surveys will occur between 08:00 and 17:00 hrs during sunny periods when air temperature is above 5 C and warmer than water temperature. Surveys conducted on partially cloudy or overcast days will only be conducted when air temperature is above 15 C and is higher than water temperature.

Bat Cavity Tree Assessment

An inspection of trees within the subject property will be completed during the leaf-off period to determine the likelihood of suitable roosting habitat for bats. Cavity tree assessments and searching for leaf roosts will follow guidelines provided by the MNRF in the April 2017 document Survey Protocol for Species at Risk Bats in Treed Habitats (MNRF 2017). The bat habitat assessments will be focused in areas of potential tree removals, to be determined in consultation with the study team.

Butterfly Surveys

Butterfly surveys are recommended to address the potential presence of SAR within the subject property. Surveys will be carried out in early June and late June. Each survey will be carried out from mid-morning to late afternoon on sunny and warm days (generally >15˚C) with low wind. Area searches within suitable habitat will be carried out with the use of binoculars, an insect net, and a hand lens. All representative habitats (ELC ecosites) will be surveyed

methodically. Suitable habitat is present within the adjacent lands to the woodlands and municipal drain.

Terrestrial Habitat Assessments and Documentation of Other Wildlife

NRSI biologists will assess wildlife habitats within the subject properties during all site visits. Any features that may be indicative of SWH or habitat for SAR will be documented in detail, photographed, and georeferenced. Observations of lepidoptera, odonata, herpetofauna, bumblebees, mammals, and all other wildlife will be recorded while on-site. In addition to direct observations, any evidence such as dens, tracks, and scat will also be documented.

Tree Inventory

NRSI will complete an inventory of all trees ≥10cm diameter at breast height (DBH) on the subject property and adjacent areas with the potential to be impacted by the proposed development. Inventoried trees will be tagged and assessed by a Certified Arborist. Each tree within the subject property will be tagged with a pre-numbered aluminum forestry tag or given a unique map identifier, and the following information will be recorded for each individual assessed tree;

- Unique alpha-numeric identifier;
- Species;
- DBH (cm);
- Crown radius (metres);
- General health (excellent, good, fair, poor, very poor);
- Potential for structural failure (improbable, possible, probable, imminent);
- Location;
- General comments (i.e., disease, aesthetic quality, development constraints, sensitivity to development);
- Management recommendations where appropriate (i.e., prune, relocate, remove, retain, etc.); and
- Rationale for any proposed action.

During the assessment of each individual tree, NRSI will record the location of the tree using a GPS unit capable of sub-meter mapping grade accuracy. A preliminary map of existing conditions will be developed to inform the proposed plans. Trees of significance (i.e., uncommon species, mature and/or large stature, trees with cultural significance, etc.) will be considered for retention where feasible.

Woodland Delineation

NRSI staff will stake the boundaries of woodland features on the subject property. These boundaries are to be reviewed and approved in the field by agency staff. The assessment of wooded features will be in accordance with the definitions outlined in the County of Elgin Official Plan (2022) and Municipality of Central Elgin Official Plan (2015).

Aquatic Field Surveys

Aquatic Habitat Assessment

Two aquatic habitat assessments will be completed on the Branch of Marr Drain and the ponds within the study area to identify existing conditions. This assessment will provide an understanding of the types and quality of aquatic habitats present. The survey will follow a modified version of the standard Ontario Stream Assessment Protocol (OSAP) methodology (Stanfield 2013). The following information will be collected, where applicable:

- General characteristics and channel morphology;
- Substrate composition;
- Flow conditions and water depths;
- In-stream and riparian vegetation;
- Location and type of fish habitat available, if present (e.g., refuge areas, nesting sites, areas and types of food supply including overhanging vegetation, woody debris, riffles, pools);
- Location and type of all culverts, water control structures and barriers to fish passage;
- Bank stability and signs of erosion;
- Adjacent land use and slopes;
- Evidence of groundwater discharge;
- Single point in time water quality measurements including dissolved oxygen, pH, conductivity, and total dissolved solids.

Fish Community Survey

A fish community inventory will be in early spring during high flow. Single pass screening surveys will be conducted to characterize the fish community present within the Branch of Marr Drain. NRSI will apply for a permit for a License to Collect Fish for Scientific Purposes immediately upon receiving approval to commence work to allow for processing time and ensure a permit is in hand by spring 2023. The watercourse will be surveyed using a backpack electrofishing unit to identify the existing fish community and assess any constraints. The fish community assessment will be conducted in conjunction with the aquatic habitat assessment.

Natural Feature, Mitigation and Constraints Assessment

The results of the field surveys will be combined with the background information to provide a detailed summary of the existing natural features that occur in and within the subject property and study area. This will include detailed vegetation community descriptions and mapping, and summaries of wildlife species present within the subject property and adjacent areas. In addition to natural features, the report will identify existing and historic land uses on the property and known modifications to these features.

Buffers to any identified natural features or habitats on the property (e.g., woodland features, hydrological features) will be recommended and mapped as environmental constraints. All other aspects of natural feature significance or sensitivity identified through the field surveys will be incorporated into this assessment, and provided to the client to inform their plans.

3. Environmental Impact Study and Tree Protection Plan Reporting

Environmental Impact Study Report

Natural Feature Assessment

The natural feature assessment detailed in Phase 2 of this plan will form the existing conditions of the EIS, including survey results, delineated wetland and other vegetation communities, and final SAR, SCC and SWH screenings. NRSI will use the reports prepared by others on the project team to summarize the assessments of surface water systems and hydrogeologic areas (including surface and groundwater conditions), geomorphic features, and natural hazards such as floodplains and erosion.

Impact Analysis, Mitigations, and Other Recommendations

An impact analysis will be completed based on the proposed site plan. The analysis will consider potential direct (e.g., habitat removal), indirect (e.g., construction-related impacts, hydrological), and induced (e.g., post-construction human use) impacts on the existing natural features. The impact analysis will be prepared based on details of the proposed development, including a summary of team documents, which may include grading details, a Stormwater Management Plan, servicing plan, erosion and sediment control plan, and other suitable documents, where available.

The report will identify natural features proposed to be protected and those proposed to be removed. Recommendations will be provided to avoid, or otherwise minimize or mitigate adverse impacts to natural features associated with the proposed development, including those associated with hydrological changes. Where applicable, recommendations may be provided for construction- or post-construction monitoring, as well as ecological restoration, enhancement, or management.

Tree Inventory and Protection Plan (TIPP)

Inventoried trees will be mapped and the location of each tree will be compared to the proposed site plan and grading plan to determine which trees can be retained, removed, or where feasible, relocated.

A Tree Inventory and Protection Plan (TIPP) will be developed in tandem with the final plans, with an effort to retain a maximum number of trees throughout the development. The plan will identify individual trees to be retained or removed including their dripline, location and type of tree protection fencing and location of information signs along the tree protection fencing.

A TIPP report will be prepared providing a summary of tree inventory results and recommendations for tree management, mitigation and compensation, if required.

Should you have any questions or comments regarding this letter, please do not hesitate to contact me.

Sincerely,

Natural Resource Solutions Inc.

Jeremy Bannon B.E.S.
Project Lead / Certified Arborist

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Appendix II
SAR and SCC Screening

Scientific Name	Common Name	S-RANK[1]	SARO[1]	COSEWIC[2]	SARA[2]	SARA Schedule[2]	Background Source	Observed by NRSI	Habitat Requirements	Suitable Habitats within Subject Property	Rationale
Birds											
Chaetura pelagica	Chimney Swift	S3B	THR	T	T	Schedule 1	BSC et al. 2006		Commonly found in urban areas near buildings; nests in chimneys, hollow trees,and crevices of rock cliffs. Feeds over open water.[3,4]	No	The subject property lacks chimneys, rock cliffs, and other suitable nesting structures required to support this species.
Colinus virginianus	Northern Bobwhite	S1?B	END	E	E	Schedule 1	BSC et al. 2006, MNRF 2022		Grassland, prairie or hay fields with woody cover in form of thickets, tangles of vines, shrubs; fence rows or woodland edges; cropland growing corn, soybeans or small grains and clover or grass; well-drained sandy or loamy soil; pond edges.[3,4]	No	Grassland, prairie, hay fields and cropland are absent from the subject property. The species may utilize agriculture fields found in the study area.
Contopus virens	Eastern Wood-pewee	S4B	SC	SC	SC	Schedule 1	BSC et al. 2006		Mid-canopy layer of forest clearings and edges of deciduous and mixed forest. Abundant in intermediate-age mature forest stands with little understory vegetation.[3,4]	Possible	This species may utilize treed features within the subject property and study area.
Dolichonyx oryzivorus	Bobolink	S4B	THR	T	T	Schedule 1	BSC et al. 2006		Large (>10 ha), open expansive grasslands, pastures, hayfields, meadows or fallow fields with dense ground cover. Occassionally nest in large (>50 ha) fields of winter wheat and rye in southwestern Ontario. [3,4]	No	Grasslands and fields of sufficient size are not present within the subject property. This species may utilize agricultural fields within the study area.
Empidonax virescens	Acadian Flycatcher	S1B	END	E	E	Schedule 1	BSC et al. 2006		Mature, shady, deciduous and mixed forests; heavily wooded ravines; creek bottoms or river swamps. Generally needs at least 30 ha of forest.[3,4]	No	Mature forest communities of sufficient size are not present within the subject property. This species may utilize woodlands in the study area.
Hirundo rustica	Barn Swallow	S4B	SC	SC	T	Schedule 1	BSC et al. 2006, MNRF 2022		Farmlands, rural areas and other open or semi-open areas near body of water. Nests almost exclusively on human-made structures such as open barns, buildings, bridges and culverts.[3,4]	Possible	The subject property contains semi-open areas and human-made structures, and is adjacent to open agricultural habitats.
Hylocichla mustelina	Wood Thrush	S4B	SC	T	T	Schedule 1	BSC et al. 2006		Carolinian and Great Lakes-St. Lawrence forest zones. Undisturbed moist mature deciduous or mixed forest with deciduous sapling growth. Near pond or swamp. Must have some trees higher than 12 m.[3,4]	Possible	Suitable forest habitat with wetland features are present in the study area and subject property.
Melanerpes erythrocephalus	Red-headed Woodpecker	S3	SC	E	E	Schedule 1	BSC et al. 2006		Open, deciduous forest with little understory; fields, parks or pasture lands with scattered large trees; wooded swamps; orchards, small woodlots or forest edges; groves of dead or dying trees. Requires cavity trees with at least 40 cm dbh.[3,4]	Possible	Forest and forest edge habitat are present within the subject property. Field surveys will confirm the presence of large cavity trees.
Parkesia motacilla	Louisiana Waterthrush	S2B	THR	T	T	Schedule 1	BSC et al. 2006		Usually steep, forested ravines with fast-flowing streams. Prefers running water, especially clear, coldwater streams, but also less frequently inhabits heavily wooded, deciduous swamps having large pools of open water.[3,4]	No	Steep, forested ravines, fast-flowing streams and swamps are not present within the subject property.
Riparia riparia	Bank Swallow	S4B	THR	T	T	Schedule 1	BSC et al. 2006		Nests in burrows in natural and human-made settings with vertical faces in silt and sand deposits. Ususally on banks of river and lakes, but also found in sand and gravel pits.[3,4]	No	River banks, sand, and gravel vertical faces are not present within the subject property.
Sturnella magna	Eastern Meadowlark	S4B, S3N	THR	T	T	Schedule 1	BSC et al. 2006		Open pastures, hayfields, grasslands or grassy meadows with elevated singing perches (small trees, shrubs or fence posts). Also weedy borders of croplands, roadsides, orchards, airports, shrubby overgrown fields or other open areas. Generally prefers larger tracts of habitat >10 ha, but will sometimes use smaller tracts.[3,4]	Possible	Weedy border habitat exists along the edges of the golf course and edges of adjacent agricultural fields.

Scientific Name	Common Name	S-RANK[1]	SARO[1]	COSEWIC[2]	SARA[2]	SARA Schedule[2]	Background Source	Observed by NRSI	Habitat Requirements	Suitable Habitats within Subject Property	Rationale
Herpetofauna											
Turtles											
Apalone spinifera	Eastern Spiny Softshell	S2	END	E		Schedule 1	MNRF 2022		Large rivers and lakes, as well as seasonally in streams, creeks, marshes, ponds, and oxbows, especially those near large rivers or lakes. Key habitat requirements: open areas for basking with basking structures, open sand or gravel nesting areas, shallow muddy or sandy substrates to bury in, deep pools for hibernation. These habitats may be spread over a large area as long as the turtles can travel between them.[5]	No	Large rivers and lakes are not present within the subject property. The pond on the property are not likely to provide sufficient habitat for this species.
Chelydra serpentina	Snapping Turtle	S4	SC	SC	SC	Schedule 1	Ontario Nature 2019		Slow-flowing rivers and streams, lakes, and permanent or semi-permanent wetlands with soft substrates and vegetation. Key habitat requirements: open areas with structures for basking, open sand or gravel areas for nesting, shallow areas with soft substrates to bury in, soft banks or substrates for hibernation.[3]	Possible	The pond on the property may provide sufficient habitat for this species. Sand traps within the golf course may provide nesting habitat.
Snakes											
Sistrurus catenatus pop. 2	Massasauga (Carolinian population)	S1	END	E	E	Schedule 1	Ontario Nature 2019		Semi-open or open habitats such as meadows, clearings, tall grass prairie, as well as bogs, marshes, forests, and forest edges. Require open areas to warm themselves in the sun. Foraging occurs in lowland habitats such as grasslands, wetlands, and bogs. Hibernate underground in mammal or crayfish burrows, root systems in shrub or forest communities.[6]	No	Tall grass prairies, meadows, bogs and marshes are not present within the subject property. This species was last reported from this area in 1930 and is no longer likely to be present within the subject property[2].
Thamnophis sauritus septentrionalis	Northern Ribbonsnake	S4	SC	SC	SC	Schedule 1	Ontario Nature 2019		Sunny grassy areas with low dense vegetation near bodies of shallow permanent quiet water; wet meadows, marshes, borders of ponds, lakes or streams.[3]	No	The pond and watercourse within the subject property lacks the low dense vegetation required to support this species.
Mammals											
Microtus pinetorum	Woodland Vole	S3?	SC	SC	SC	Schedule 1	Dobbyn 1994		Mature deciduous forest in the Carolinian region where there is a deep litter layer that allows it to burrow.[3,4]	Possible	Forest communities within the subject proeprty may support this species.
Myotis leibii	Eastern Small-footed Myotis	S2S3	END				Dobbyn 1994		Roosts in caves, mine shafts, crevices or buildings that are in or near woodland. Hibernates in cold dry caves or mines. Maternity colonies in caves or buildings. Hunts in forests.[3,4]	Possible	The buildings and forest communities within the subject property and study area may support this species.
Myotis septentrionalis	Northern Myotis	S3	END	E	E	Schedule 1	Dobbyn 1994		Roosts in houses and man-made structures but prefers hollow trees or under loose bark. Hibernates in mines or caves. Hunts within forest, below the canopy.[3,4]	Possible	The buildings and forest communities within the subject property and study area may support this species.
Taxidea taxus jacksoni	American Badger (Southwestern Ontario population)	S2	END	E	E	Schedule 1	Dobbyn 1994		Open grasslands, oak savannahs, sand barrens and farmland.[3,4]	Possible	Open grasslands and farmland are present within the study area and along the borders of the subject property.
Butterflies											
Danaus plexippus	Monarch	S2N, S4B	SC	END	SC	Schedule 1	Macnaughton et al. 2022		Adults found in a diversity of habitats with a variety of wildflowers. Caterpillars are confined to meadows and open areas where milkweeds grow (larval food plants).[3]	Possible	Milkweed (*Ascelpias* sp.) are likely to be present within the subject property.

Scientific Name	Common Name	S-RANK[1]	SARO[1]	COSEWIC[2]	SARA[2]	SARA Schedule[2]	Background Source	Observed by NRSI	Habitat Requirements	Suitable Habitats within Subject Property	Rationale
Plants											
Juglans cinerea	Butternut	S2?	END	E	E	Schedule 1	MNRF 2022		Stream banks and swamps, as well as upland beech-maple, oak-hickory, and mixed hardwood stands.[7]	Possible	Upland forest communities are present within the subject property. This species is also reported from the area directly south of the subject property.
Panax quinquefolius	Ginseng	S2	END	E	E	Schedule 1	MNRF 2022		Rich, even swamy, hardwoods (beech, sugar maple, hemlock), especially on slopes or ravines (including forested dunes). Flowering in early summer.[7]	Possible	Forest communities within the subject property may support this species.
Phegopteris hexagonoptera	Broad Beech Fern	S3	SC	SC	SC	Schedule 3	MNRF 2022		Rich, moist decisuous forests, often at bases of slopes, edges of seeps, and along streams.[7]	Possible	Forest communities within the subject property may support this species.

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Appendix III
SWH Screening

Significant Wildlife Habitat Type	Presence Within Study Area	Presence Within Subject Property	Assessment Details
Seasonal Concentration Areas			
Waterfowl Stopover and Staging Areas (Terrestrial)	Possible	Not Present	Agricultural fields found in the study area may flood with sheet water. Sheet water flooding does not occur within the subject property.
Waterfowl Stopover and Staging Areas (Aquatic)	Not Present	Not Present	Water bodies within the subject property and study area are limited to constructed ponds within the golf course, which do not qualify as SWH.
Shorebird Migratory Stopover Area	Not Present	Not Present	Shoreline habitat is not present within the subject property or study area.
Raptor Wintering Area	Candidate	Not Present	The study area contains large woodlands adjacent to agricultural fields that may provide suitable wintering raptor habitat. Suitable habitat features are not present in the subject property.
Bat Hibernacula	Not Present	Not Present	The subject property and study area are not expected to contain caves, mine shafts, underground foundations, or karsts.
Bat Maternity Colonies	Candidate	Candidate	Trees within subject property and study area may have suitable, large wildlife trees to support bat maternity colonies.
Turtle Wintering Area	Possible	Possible	The constructed ponds on the property may possibly provide sufficient habitat for wintering turtles, provided suitable substrates and water depth are present. The portion of Kettle Creek that falls within the the study area may also provide suitable habitat.
Reptile Hibernaculum	Candidate	Candidate	Snake hibernacula may occur throughout naturalized portions of the subject property and study area.
Colonially - Nesting Bird Breeding Habitat (Bank and Cliff)	Possible	Not Present	The subject property is not expected to contain exposed banks suitable for swallow nesting. Exposed soil may be found on the banks of Kettle Creek within the study area.
Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs)	Not Present	Not Present	Wetlands with standing trees are not present in the subject property or study area.
Colonially - Nesting Bird Breeding Habitat (Ground)	Not Present	Not Present	Rocky islands and peninsulas are not present in the subject property or study area.
Migratory Butterfly Stopover Areas	Possible	Possible	The study area lies within 5km of Lake Erie and contains open field and treed habitats.
Landbird Migratory Stopover Areas	Candidate	Candidate	Woodlots of suitable size are present in the study area and subject property. The study area is within 5km of Lake Erie.
Deer Winter Congregation Areas	Not Present	Not Present	Deer wintering area has not been identiied to occur within the subject property and study area.
Rare Vegetation Communities			
Cliff and Talus Slopes	Not Present	Not Present	Cliff and talus slope habitat have not been observed in the subject property or study area.
Sand Barrens	Not Present	Not Present	Sand barren habitat has not been observed in the subject property or study area.
Alvar	Not Present	Not Present	Alvar habitat has not been observed in the subject property or study area.
Old Growth Forest	Possible	Not Present	Old growth forest habitat has not been identified in the subject property or study area.
Savannah	Not Present	Not Present	Savannah habitat has not been observed in the subject property or study area.
Tallgrass Prairie	Not Present	Not Present	Tallgrass prairie habitat has not been observed in the subject property or study area.
Other Rare Vegetation Communities	Not Present	Not Present	No rare vegetation communities were identified in the subject property or study area during the preliminary site investigation.
Specialized Wildlife Habitat			
Waterfowl Nesting Area	Possible	Not Present	Open aquatic features and adjacent upland habitat within the subject property are expected to be too disturbed to support waterfowl nesting. Waterfowl may utilize wetlands within the study area.
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat	Possible	Not Present	Nests may be found on large trees near the banks of Kettle Creek in the study area. Suitable nesting habitat is not present on the subject property.
Woodland Raptor Nesting Habitat	Possible	Possible	Forests within the study area contain suitable interior habitat to support woodland raptor nesting. No stick nests were observed in contiguous forest habitat on the subject property during the preliminary site investigation.
Turtle Nesting Areas	Candidate	Candidate	Edges of ponds and the watercourse within the study area may provide nesting habitat for turtles. Sand traps within the golf course may also be utilized by turtles for nesting.
Seeps and Springs	Possible	Not Present	Seeps and springs may be found within forest communities in the study area. These features were not observed during the preliminary site investigation.
Amphibian Breeding Habitat (Woodland)	Candidate	Candidate	Pools and wetlands may be present within the forest communities in the study area. The pond and watercourse within the study area may also provide sufficient habitat and are within 120m of forest communities.
Amphibian Breeding Habitat (Wetland)	Not Present	Candidate	While disturbed, amphibians may utilize golf ponds within the subject property for breeding.
Woodland Area-Sensitive Bird Breeding Habitat	Possible	Not Present	Forest communities in the study area are of suitable size to support these species.
Habitat for Species of Conservation Concern			
Marsh Bird Breeding Habitat	Possible	Not Present	Wetlands within the study area may support marsh bird breeding. Ponds within the golf course are expected to lack suitable vegetative cover.
Open Country Bird Breeding Habitat	Not Present	Not Present	The subject property and study area lack grassland habitat. Agricultural fields within the study area are active and unsuitable.
Shrub/Early Successional Bird Breeding Habitat	Not Present	Not Present	The subject property and study area do not contain shrub and thicket habitat >10ha. Agricultural fields within the study area are active and unsuitable.

Significant Wildlife Habitat Type	Presence Within Study Area	Presence Within Subject Property	Assessment Details
Terrestrial Crayfish	Possible	Not Present	Terrestrial crayfish chimneys may be found in agricultural fields within the study area.
Special Concern and Rare Wildlife Species	Possible	Possible	Several special concern and rare wildlife species have been reported from the area. Field surveys will confirm the presence of suitable habitat for these species.
Animal Movement Corridors			
Amphibian Movement Corridors	Possible	Possible	Breeding pools may be present within the forest communities found in the study area, and connected to other habitats via these treed corridors. The riparian zone along the watercourse may also provide a movement corridior for amphibians. Anuran call surveys will confirm breeding activity in these wetlands and potential pools.
Exceptions			
Bat Migratory Stopover Area	Not Present	Not Present	This subject property and study area occur outside of the known stopover habitat for bats.

Significant Wildlife Habitat Assessment Tables

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E (MNRF 2015)

	Candidate SWH			Confirmed SWH	Assessment Details	
Rationale	**Wildlife Species**	**ELC Ecosite Codes**	**Habitat Criteria and Information Sources**	**Defining Criteria**	**Study Area**	**Subject Property**
Wildlife Habitat: Waterfowl Stopover and Staging Areas (Terrestrial)					Possible	Not Present
Habitat important to migrating waterfowl	American Black Duck Northern Pintail Gadwall Blue-winged Teal Green-winged Teal American Wigeon Northern Shoveler Tundra Swan	CUM1 CUT1 - Plus evidence of annual spring flooding from melt water or run-off within these Ecosites. - Fields with seasonal flooding and waste grain in the Long Point, Rondeau, Lake. St. Clair, Grand Bend and Pt. Pelee areas may be important to Tundra Swans.	Fields with sheet water during Spring (mid March to May). • Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl. • Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless they have spring sheet water available[cxlviii] <u>Information Sources</u> • Anecdotal information from the landowner, adjacent landowners or local naturalist clubs may be good information in determining occurrence. • Reports and other information available from Conservation Authorities (CAs) • Sites documented through waterfowl planning processes (eg. EHJV implementation plan) • Field Naturalist Clubs • Ducks Unlimited Canada • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • Any mixed species aggregations of 100[l] or more individuals required. • The area of the flooded field ecosite habitat plus a 100-300m radius buffer dependant on local site conditions and adjacent land use is the significant wildlife habitat[cxlviii]. • Annual use of habitat is documented from information sources or field studies (annual use can be based on studies or determined by past surveys with species numbers and dates). • SWHMIST[cxlix] Index #7 provides development effects and mitigation measures.	Agricultural fields found in the study area may flood with sheet water. Sheet water flooding does not occur within the subject property.	
Wildlife Habitat: Waterfowl Stopover and Staging Areas (Aquatic)					Not Present	Not Present
Important for local and migrant waterfowl populations during the spring or fall migration or both periods combined. Sites identified are usually only one of a few in the eco-district	Canada Goose Cackling Goose Snow Goose Green-winged Teal American Black Duck Northern Pintail Northern Shoveler American Wigeon Gadwall Blue-winged Teal Hooded Merganser Common Merganser Red-breasted Merganser Lesser Scaup Greater Scaup Common Goldeneye Bufflehead Long-tailed Duck Surf Scoter White-winged Scoter Black Scoter Canvasback Redhead Ruddy Duck Brant White-winged Scoter Black Scoter	MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7	• Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify. • These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water). <u>Information Sources</u> • Environment Canada • Naturalist clubs often are aware of staging/stopover areas • OMNRF Wetland Evaluations indicate presence of locally and regionally significant waterfowl staging. • Sites documented through waterfowl planning processes (eg. EHJV implementation plan) • Ducks Unlimited projects • Element occurrence specification by Nature Serve: http://www.natureserve.org • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of: • Aggregations of 100[l] or more of listed species for 7 days[l], results in >700 waterfowl use days. • Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH[cxlix] • The combined area of the ELC ecosites and a 100m radius area is the SWH[cxlviii] • Wetland area and shorelines associated with sites identified within the SWHTG[cxlviii] Appendix K[cxlix] are significant wildlife habitat. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species numbers and dates recorded). • SWHMIST[cxlix] Index #7 provides development effects and mitigation measures.	Water bodies within the subject property and study area are limited to constructed ponds within the golf course, which do not qualify as SWH.	

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E (MNRF 2015)

	Candidate SWH			Confirmed SWH	Assessment Details	
Rationale	**Wildlife Species**	**ELC Ecosite Codes**	**Habitat Criteria and Information Sources**	**Defining Criteria**	**Study Area**	**Subject Property**
Wildlife Habitat: Shorebird Migratory Stopover Area					Not Present	Not Present
High quality shorebird stopover habitat is extremely rare and typically has a long history of use	Greater Yellowlegs Lesser Yellowlegs Marbled Godwit Hudsonian Godwit Black-bellied Plover American Golden-Plover Semipalmated Plover Solitary Sandpiper Spotted Sandpiper Semipalmated Sandpiper Pectoral Sandpiper White-rumped Sandpiper Baird's Sandpiper Least Sandpiper Purple Sandpiper Stilt Sandpiper Short-billed Dowitcher Red-necked Phalarope Whimbrel Ruddy Turnstone Sanderling Dunlin	BBO1 BBO2 BBS1 BBS2 BBT1 BBT2 SDO1 SDS2 SDT1 MAM1 MAM2 MAM3 MAM4 MAM5	Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. Sewage treatment ponds and storm water ponds do not qualify as a SWH. <u>Information Sources</u> • Western hemisphere shorebird reserve network • Canadian Wildlife Service (CWS) Ontario Shorebird Survey • Bird Studies Canada • Ontario Nature • Local birders and naturalist clubs • Natural Heritage Information Center (NHIC) Shorebird Migratory Concentration Area	Studies confirming: • Presence of 3 or more of listed species and > 1000[i] shorebird use days during spring or fall migration period (shorebird use days are the accumulated number of shorebirds counted per day over the course of the fall or spring migration period). • Whimbrel stop briefly (<24hrs) during spring migration, any site with >100[i] Whimbrel used for 3 years or more is significant. • The area of significant shorebird habitat includes the mapped ELC shoreline ecosites plus a 100m radius area[cxlviii] • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMIST[cxlix] Index #8 provides development effects and mitigation measures.	Shoreline habitat is not present within the subject property or study area.	
Wildlife Habitat: Raptor Wintering Area					Candidate	Not Present
Sites used by multiple species, a high number of individuals and used annually are most significant	Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl <u>Special Concern</u>: Short-eared Owl Bald Eagle	<u>Hawks/Owls:</u> Combination of ELC Community Series; need to have present one Community Series from each land class. Forest: FOD, FOM, FOC Upland: CUM, CUT, CUS, CUW <u>Bald Eagle:</u> Forest Community Series: FOD, FOM, FOC, SWD, SWM, or SWC, on shoreline areas adjacent to large rivers or adjacent to lakes with open water (hunting area).	The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. Raptor wintering (hawk/owl) sites need to be > 20ha[cxlviii, cxlix] with a combination of forest and upland[xvi, xvii, xviii, xix, xx, xxi]. Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands[cxlix] Field area of the habitat is to be wind swept with limited snow depth or accumulation. Eagle sites have open water and large trees and snags aviable for roosting[cxlix] <u>Information Sources</u> • OMNRF Districts • Natural clubs • Natural Heritage Information Centre (NHIC) Raptor Winter Concentration Area • Data from Bird Studies Canada • Reports and other information available from CAs • Results of Christmas Bird Counts	Studies confirm the use of these habitats by: • One or more Short-eared Owls, or, One of more Bald Eagles or; at least 10 individuals and two listed hawk/owl species • To be significant a site must be used regularly (3 in 5 years)[cxlix] for a minimum of 20 days by the above number of birds[j]. • The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMIST[cxlix] Index #10 and #11 provides development effects and mitigation measures.	The study area contains large woodlands adjacent to agricultural fields that may provide suitable wintering raptor habitat. Suitable habitat features are not present in the subject property.	

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E (MNRF 2015)

	Candidate SWH			Confirmed SWH	Assessment Details	
Rationale	**Wildlife Species**	**ELC Ecosite Codes**	**Habitat Criteria and Information Sources**	**Defining Criteria**	**Study Area**	**Subject Property**
Wildlife Habitat: Bat Hibernacula					Not Present	Not Present
Bat hibernacula, are rare habitats in all Ontario landscapes.	Big Brown Bat Eastern Pipistrelle/Tri-colored Bat	Bat Hibernacula may be found in these ecosites: CCR1 CCR2 CCA1 CCA2 (Note: buildings are not considered to be SWH)	Hibernacula may be found in caves, mine shafts, underground foundations and Karsts. Active mine sites should not be considered The locations of bat hibernacula are relatively poorly known. <u>Information Sources</u> • OMNRF for possible locations and contact for local experts • Natural Heritage Information Centre (NHIC) Bat Hibernaculum • Ministry of Northern Development and Mines for location of mine shafts • Clubs that explore caves (eg. Sierra Club) • University Biology Departments with bat experts	• All sites with confirmed hibernating bats are SWH[l]. • The area includes 200m radius around the entrance of the hibernaculum[cxlviii, ccvii, l]. for the development types and 1000m for wind farms [ccv]. • Studies are to be conducted during the peak swarming period (Aug. – Sept.). Surveys should be conducted following methods outlined in the[ccv]."Bats and Bat Habitats: Guidelines for Wind Power Projects" [ccv] • SWHMIST[cxlix] Index #1 provides development effects and mitigation measures.	The subject property and study area are not expected to contain caves, mine shafts, underground foundations, or karsts.	
Wildlife Habitat: Bat Maternity Colonies					Candidate	Candidate
Known locations of forested bat maternity colonies are extremely rare in all Ontario landscapes.	Big Brown Bat Silver-haired Bat	Maternity colonies considered SWH are found in forested Ecosites. All ELC Ecosites in ELC Community Series: FOD FOM SWD SWM	Maternity colonies can be found in tree cavities, vegetation and often in building [sxxii, xxv, xxvi, xxvii, xxxi] (buildings are not considered to be SWH). • Maternity roosts are not found in caves and mines in Ontario[xxii]. • Maternity colonies located in Mature deciduous or mixed forest stands[ccix, ccx] with >10/ha large diameter (>25cm dbh) wildlife trees[ccvii]. • Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3[ccxiv] or class 1 or 2[ccxii]. • Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred[ccx]. <u>Information Sources</u> • OMNRF for possible locations and contact for local experts • University Biology Departments with bat experts	Maternity Colonies with confirmed use by: • >10 Big Brown Bats[l] • >5 Adult Female Silver-haired Bats[l] • The area of the habitat includes the entire woodland or the forest stand ELC Ecosite containing the maternity colonies[l]. • Evaluation methods for maternity colonies should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for Wind Power Projects"[ccv]. • SWHMIST[cxlix] Index #12 provides development effects and mitigation measures.	Trees within subject property and study area may have suitable, large wildlife trees to support bat maternity colonies.	

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E (MNRF 2015)

	Candidate SWH			Confirmed SWH	Assessment Details	
Rationale	**Wildlife Species**	**ELC Ecosite Codes**	**Habitat Criteria and Information Sources**	**Defining Criteria**	**Study Area**	**Subject Property**
Wildlife Habitat: Turtle Wintering Area					Possible	Possible
Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant.	Midland Painted Turtle <u>Special Concern</u>: Northern Map Turtle Snapping Turtle	Snapping and Midland Painted Turtles: ELC Community Classes: SW, MA, OA and SA ELC Community Series: FEO and BOO Northern Map Turtle: Open Water areas such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.	• For most turtles, wintering areas are in the same general area as their core habitat. Water has to be deep enough not to freeze and have soft mud substrates. • Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen[cix, cx, cxi, cxviii]. • Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH <u>Information Sources</u> • EIS studies carried out by Conservation Authorities • Field naturalists clubs • OMNRF Ecologist or Biologist • Natural Heritage Information Centre (NHIC)	• Presence of 5 over-wintering Midland Painted Turtles is significant[l]. • One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant[l]. • The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH. • Over wintering areas may be identified by searching for congregations (Basking Areas) of turtles on warm, sunny days during the fall (Sept. – Oct.) or spring (Mar. – Apr)[cvii]. Congregation of turtles is more common where wintering areas are limited and therefore significant[cix, cx, cxi, cxii]. • SWHMIST[cxlix] Index #28 provides development effects and mitigation measures for turtle wintering habitat.	The constructed ponds on the property may possibly provide sufficient habitat for wintering turtles, provided suitable substrates and water depth are present. The portion of Kettle Creek that falls within the the study area may also provide suitable habitat.	
Wildlife Habitat: Reptile Hibernaculum					Candidate	Candidate
Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant	<u>Snakes:</u> Eastern Gartersnake Northern Watersnake Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake <u>Special Concern</u>: Milksnake Eastern Ribbonsnake	For all snakes, habitat may be found in any ecosite in southern Ontario other than very wet ones. Talus, Rock Barren, Crevice and Cave, and Alvar sites may be directly related to these habitats. Observations of congregations of snakes on sunny warm days in the spring or fall is a good indicator. The existence of rock piles or slopes, stone fences, and crumbling foundations assist in identifying candidate SWH.	For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural locations. Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line[xliv, l, li, lii, cxii]. Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover. <u>Information Sources</u> • In spring, local residents or landowners may have observed the emergence of snakes on their property (e.g. old dug wells). • Reports and other information available from CAs • Local naturalists and experts, as well as university herpetologists may also know where to find some of these sites. • Natural Heritage Information Centre (NHIC)	Studies confirming: • Presence of snake hibernacula used by a minimum of five individuals of a snake sp., or, individuals of two or more snake spp. • Congregations of a minimum of five individuals of a snake sp., or, individuals of two or more snake spp. near potential hibernacula (eg. foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct)[l]. • Note: If there are Special Concern Species present, then site is SWH • Note: Sites for hibernation possess specific habitat parameters (e.g. temperature, humidity, etc.) and consequently are used annually, often by many of the same individuals of a local population (i.e. strong hibernation site fidelity). Other critical life processes (e.g. mating) often take place in close proximity to hibernacula. The feature in which the hibernacula is located plus a 30m buffer is the SWH[l]. • SWHMIST[cxlix] Index #13 provides development effects and mitigation measures for snake hibernacula.	Snake hibernacula may occur throughout naturalized portions of the subject property and study area.	

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E (MNRF 2015)

	Candidate SWH			Confirmed SWH	Assessment Details	
Rationale	**Wildlife Species**	**ELC Ecosite Codes**	**Habitat Criteria and Information Sources**	**Defining Criteria**	**Study Area**	**Subject Property**
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Bank and Cliff)					Possible	Not Present
Historical use and number of nests in a colony make this habitat significant. An identified colony can be very important to local populations. All swallow population are declining in Ontario.	Cliff Swallow Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies)	Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles Cliff faces, bridge abutments, silos, barns Habitat found in the following ecosites: CUM1 CUT1 CUS1 BLO1 BLS1 BLT1 CLO1 CLS1 CLT1	• Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area. • Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles. • Does not include a licensed/permitted Mineral Aggregate Operation. <u>Information Sources</u> • Reports and other information available from CAs • Ontario Breeding Bird Atlas[ccv]. • Bird Studies Canada: Nature Counts http://www.birdscanada.org/birdmon/ • Field Naturalist clubs	Studies confirming: • Presence of 1 or more nesting sites with 8[cxlvix] or more cliff swallow pairs and/or rough-winged swallow pairs during the breeding season. • A colony identified as SWH will include a 50m radius habitat area from the peripheral nests[ccvii]. • Field surveys to observe and count swallow nests are to be completed during the breeding season. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”[ccxi]. • SWHMIST[cxlix] Index #4 provides development effects and mitigation measures.	The subject property is not expected to contain exposed banks suitable for swallow nesting. Exposed soil may be found on the banks of Kettle Creek within the study area.	
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs)					Not Present	Not Present
Large colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Great Blue Heron Black-crowned Night-Heron Great Egret Green Heron	SWM2 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1	• Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used. • Most nests in trees are 11 to 15 m from ground, near the top of the tree. <u>Information Sources</u> • Ontario Breeding Bird Atlas[ccv], colonial nest records. • Ontario Heronry Inventory 1991 available from Bird Studies Canada or NHIC (OMNRF). • Natural Heritage Information Centre (NHIC) Mixed Wader Nesting Colony • Aerial photographs can help identify large heronries. • Reports and other information available from CAs • MNRF District Offices • Field naturalist clubs	Studies confirming: • Presence of 2 or more active nests of Great Blue Heron or other list species. • The habitat extends from the the edge of the colony and a minimum 300m radius or extent of the Forest Ecosite containing the colony or any island <15.0ha with a colony is the SWH[cc, ccvii]. • Confirmation of active colonies must be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the presence of fresh guano, dead young and/or eggshells • SWHMIST[cxlix] Index #5 provides development effects and mitigation measures.	Wetlands with standing trees are not present in the subject property or study area.	

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E (MNRF 2015)

	Candidate SWH			Confirmed SWH	Assessment Details	
Rationale	**Wildlife Species**	**ELC Ecosite Codes**	**Habitat Criteria and Information Sources**	**Defining Criteria**	**Study Area**	**Subject Property**
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Ground)					Not Present	Not Present
Colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern Caspian Tern Brewer's Blackbird	Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1:50,000 NTS map). Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird) MAM1 – 6 MAS1 – 3 CUM CUT CUS	• Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas. • Brewers Blackbird colonies are found loosely on the ground in or in low bushes in close proximity to streams and irrigation ditches within farmlands. <u>Information Sources</u> • Ontario Breeding Bird Atlas[ccv], rare/colonial species records. • Canadian Wildlife Service • Reports and other information available from CAs • Natural Heritage Information Centre (NHIC) Colonial Waterbird Nesting Area • MNRF District Offices • Field naturalist clubs	Studies confirming: • Presence of >25 active nests for Herring Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern[l]. • Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant[l]. • Presence of 5 or more pairs for Brewer's Blackbird[l]. • The edge of the colony and a minimum 150m radius area of the habitat, or the extent of the ELC ecosites containing the colony or any island <3.0ha with a colony is the SWH[cc, ccvii]. • Studies would be done during May/June when actively nesting. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi]. • SWHMIST[cxlix] Index #6 provides development effects and mitigation measures.	Rocky islands and peninsulas are not present in the subject property or study area.	
Wildlife Habitat: Migratory Butterfly Stopover Areas					Possible	Possible
<u>Rationale:</u> Butterfly stopover areas are extremely rare habitats and are biologically important for butterfly species that migrate south for the winter	Painted Lady Red Admiral <u>Special Concern</u>: Monarch	Combination of ELC Community Series; need to have present one Community Series from each landclass: Field: CUM CUT CUS Forest: FOC FOD FOM CUP Anecdotally, a candidate sight for butterfly stopover will have a history of butterflies being observed.	A butterfly stopover area will be a minimum of 10ha in size with a combination of field and forest habitat present, and will be located within 5km of Lake Ontario and Erie[cxlix]. • The habitat is typically a combination of field and forest, and provides the butterflies with a location to rest prior to their long migration south [xxxii, xxxiii, xxxiv, xxxv, xxxvi]. • The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat [cxlviii, cxlix]. • Staging areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes [xxxvii, xxxviii, xxxix, xl, xli]. <u>Information Sources</u> • MNRF District Offices • Natural Heritage Information Centre (NHIC) • Agriculture Canada in Ottawa may have list of butterfly experts. • Field Naturalist Clubs • Toronto Entomologists Association • Conservation Authorities	Studies confirm: • The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct)[xliii]. MUD is based on the number of days a site is used by Monarchs, multiplied by the number of individuals using the site. Numbers of butterflies can range from 100-500/day[xxxvii], significant variation can occur between years and multiple years of sampling should occur[xl, xlii]. • Observational studies are to be completed and need to be done frequently during the migration period to estimate MUD • MUD of >5000 or >3000 with the presence of Painted Ladies or White Admiral's is to be considered significant[l]. • SWHMIST[cxlix] Index #16 provides development effects and mitigation measures.	The study area lies within 5km of Lake Erie and contains open field and treed habitats.	

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E (MNRF 2015)

	Candidate SWH			Confirmed SWH	Assessment Details	
Rationale	**Wildlife Species**	**ELC Ecosite Codes**	**Habitat Criteria and Information Sources**	**Defining Criteria**	**Study Area**	**Subject Property**
Wildlife Habitat: Landbird Migratory Stopover Areas					Candidate	Candidate
Sites with a high diversity of species as well as high numbers are most significant	All migratory songbirds Canadian Wildlife Service Ontario website: http://www.on.ec.gc.ca/wildlife_e.html All migrant raptors species Ontario Ministry of Natural Resources: Fish and Wildlife Conservation Act, 1997. Schedule 7: Specially Protected Birds (Raptors)	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD	Woodlots need to be >5 ha[I] in size and within 5km [iv, v, vi, vii, viii, ix, x, xi, xii, xiii, xiv, xv] of Lake Ontario and Erie. If woodlands are rare in an area of shoreline, woodland fragments 2-5ha can be considered for this habitat • If multiple woodlands are located along the shoreline those Woodlands <2km from Lake Erie or Ontario are more significant[cxlix]. • Sites have a variety of habitats: forest, grassland and wetland complexes[cxlix]. • The largest sites are more significant[cxlix] • Woodlots and forest fragments are important habitats to migrating birds[ccxviii], these features located along the shore and located within 5km of Lake Ontario and Lake Erie are Candidate SWH[cxlviii]. <u>Information Sources</u> • Bird Studies Canada • Ontario Nature • Local birders and naturalist clubs • Ontario Important Bird Areas (IBA) Program	Studies confirm: • Use of the habitat by >200 birds/day and with >35 spp. with at least 10 bird spp. recorded on at least 5 different survey dates[I]. This abundance and diversity of migrant bird species is considered above average and significant. • Studies should be completed during spring (March/May) and fall (Aug/Oct) migration using standardized assessment techniques. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”[ccxi]. • SWHMIST[cxlix] Index #9 provides development effects and mitigation measures.	Woodlots of suitable size are present in the study area and subject property. The study area is within 5km of Lake Erie.	
Wildlife Habitat: Deer Winter Congregation Areas					Not Present	Not Present
Deer movement during winter in the southern areas of Ecoregion 7E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands to reduce or avoid the impacts of winter conditions [cxlviii]	White-tailed Deer	All Forested Ecosites with these ELC Community Series: FOC FOM FOD SWC SWM SWD Conifer plantations (CUP) smaller than 50 ha may also be used.	• Woodlots >100 ha in size or if large woodlots are rare in a planning area woodlots>50ha[I]. • Deer movement during winter in Ecoregion 7E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands[cxlviii]. • Large woodlots > 100ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha[ccxxiv]. • Woodlots with high densities of deer due to artificial feeding are not significant[I]. <u>Information Sources</u> • MNRF District Offices • LIO/NRVIS	Studies confirm: • Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF[cxlviii]. • Use of the woodlot by white-tailed deer will be determined by MNRF, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNRF[I]. • Studies should be completed during winter (Jan/Feb) when >20cm of snow is on the ground using aerial survey techniques[ccxxiv], ground or road surveys, or a pellet count deer density survey[ccxxv]. • SWHMIST[cxlix] Index #2 provides development effects and mitigation measures.	Deer wintering area has not been identiied to occur within the subject property and study area.	

Significant Wildlife Habitat Assessment Tables

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 7E (MNRF 2015)

	Candidate SWH			Confirmed SWH	Assessment Details	
Rationale	**ELC Ecosite Codes**	**Habitat Description**	**Detailed Information and Sources**	**Defining Criteria**	**Study Area**	**Subject Property**
Cliff and Talus Slopes					Not Present	Not Present
Cliffs and Talus Slopes are extremely rare habitats in Ontario.	Any ELC Ecosite within Community Series: TAO TAS TAT CLO CLS CLT	A Cliff is vertical to near vertical bedrock >3m in height. A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris.	Most cliff and talus slopes occur along the Niagara Escarpment. <u>Information Sources</u> • The Niagara Escarpment Commission has detailed information on location of these habitats. • OMNRF Districts • Natural Heritage Information Centre (NHIC) has location information available on their website • Field naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Cliffs or Talus Slopes[lxxviii] • SWHMIST[cxlix] Index #21 provides development effects and mitigation measures.	Cliff and talus slope habitat have not been observed in the subject property or study area.	
Sand Barrens					Not Present	Not Present
Sand barrens are rare in Ontario and support rare species. Most Sand Barrens have been lost due to cottage development and forestry.	ELC Ecosites: SBO1 SBS1 SBT1 Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always ≤ 60%.	Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. They have little or no soil and the underlying rock protrudes through the surface. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered but less than 60%.	A sand barren area >0.5ha in size <u>Information Sources</u> • OMNRF Districts • Natural Heritage Information Centre (NHIC) has location information available on their website • Field naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Sand Barrens[lxxviii] • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotics sp)[i]. • SWHMIST[cxlix] Index #20 provides development effects and mitigation measures.	Sand barren habitat has not been observed in the subject property or study area.	

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 7E (MNRF 2015)

	Candidate SWH			Confirmed SWH	Assessment Details	
Rationale	**ELC Ecosite Codes**	**Habitat Description**	**Detailed Information and Sources**	**Defining Criteria**	**Study Area**	**Subject Property**
Alvar					Not Present	Not Present
Alvars are extremely rare habitats in Ecoregion 7E	ALO1 ALS1 ALT1 FOC1 FOC2 CUM2 CUS2 CUT2-1 CUW2 Five Alvar Indicator Species: 1) *Carex crawei* 2) *Panicum philadelphicum* 3) *Eleocharis compressa* 4) *Scutellaria parvula* 5) *Trichostema brachiatum* These indicator species are very specific to Alvars within Ecoregion 7E[cxlix]	An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plant. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animals species. Vegetation cover varies from patchy to barren with a less than 60% tree cover[lxxviii].	An Alvar site > 0.5ha in size[lxxv]. Alvar is particularly rare in Ecoregion 7E where the only known sites are found in the western islands of Lake Erie[cxcix]. <u>Information Sources</u> • Alvars of Ontario (2000), Federation of Ontario Naturalists[lxxvi]. • Ontario Nature – Conserving Great Lakes Alvars[ccviii]. • Natural Heritage Information Centre (NHIC) has location information available on their website • OMNRF Staff • Field Naturalist clubs • Conservation Authorities	Field studies identify four of the five **Alvar indicator species**[lxxv] at a candidate Alvar site is Significant • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). • The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses[lxxv]. • SWHMIST[cxlix] Index #17 provides development effects and mitigation measures.	Alvar habitat has not been observed in the subject property or study area.	

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 7E (MNRF 2015)

	Candidate SWH			Confirmed SWH	Assessment Details	
Rationale	**ELC Ecosite Codes**	**Habitat Description**	**Detailed Information and Sources**	**Defining Criteria**	**Study Area**	**Subject Property**
Old Growth Forest					Possible	Not Present
Due to historic logging practices and land clearance for agriculture, old growth forest is rare in Ecoregion 7E.	Forest Community Series: FOD FOC FOM SWD SWC SWM	Old growth forests are characterized by heavy mortality or turnover of overstorey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris.	Woodland area is >0.5ha <u>Information Sources</u> • OMNRF Forest Resource Inventory mapping • OMNRF Districts • Field naturalist clubs • Conservation Authorities • Sustainable Forestry Licence (SFL) companies will possibly know locations through field operations. • Municipal forestry departments	Field Studies will determine: • If dominant trees species of the ecosite are >140 years old, then stand is Significant Wildlife Habitat[cxlviii]. • The forested area containing the old growth characteristics will have experienced no recognizable forestry activities [cxlviii] (cut stumps will not be present) • Determine ELC Vegetation Type for forest area containing the old growth characteristics[lxxviii]. • SWHMIST[cxlix] Index #23 provides development effects and mitigation measures.	Old growth forest habitat has not been identified in the subject property or study area.	
Savannah					Not Present	Not Present
Savannahs are extremely rare habitats in Ontario.	TPS1 TPS2 TPW1 TPW2 CUS2	A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%. In Ecoregion 7E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario)[cc].	No minimum size to site[l] Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. <u>Information Sources</u> • OMNRF Districts • Natural Heritage Information Centre (NHIC) has location data available on their website • Field naturalists clubs • Conservation Authorities	Field studies confirm one or more of the Savannah indicator species listed in[lxxv] Appendix N should be present[l]. Note: Savannah plant spp. list from Ecoregion 7E should be used. • Area of the ELC Vegetation type is the SWH[lxxviii]. • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). • SWHMIST[cxlix] Index #18 provides development effects and mitigation measures.	Savannah habitat has not been observed in the subject property or study area.	

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 7E (MNRF 2015)

	Candidate SWH			Confirmed SWH	Assessment Details	
Rationale	**ELC Ecosite Codes**	**Habitat Description**	**Detailed Information and Sources**	**Defining Criteria**	**Study Area**	**Subject Property**
Tallgrass Prairie					Not Present	Not Present
Tallgrass Prairies are extremely rare habitats in Ontario.	TPO1 TPO2	A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover. In Ecoregion 7E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario)[cc].	No minimum size to site[i]. Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. <u>Information Sources</u> • Natural Heritage Information Centre (NHIC has location information available on their website • OMNRF Districts • Field naturalists clubs • Conservation Authorities	Field studies confirm one or more of the Prairie indicator species listed in[lxxv] Appendix N should be present[i]. Note: Prairie plant spp. list from Ecoregion 7E should be used. • Area of the ELC Vegetation Type is the SWH[lxxviii]. • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). • SWHMIST[cxlix] Index #19 provides development effects and mitigation measures.	Tallgrass prairie habitat has not been observed in the subject property or study area.	
Other Rare Vegetation Communities					Not Present	Not Present
Plant communities that often contain rare species which depend on the habitat for survival.	Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG[cxlviii]. Any ELC Ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH.	Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps.	ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in appendix M[cxlviii]. The OMNRF/NHIC will have up to date listing for rare vegetation communities. <u>Information Sources</u> • Natural Heritage Information Centre (NHIC) has location information available on their website • OMNRF Districts • Field naturalists clubs • Conservation Authorities	Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWHTG[cxlviii]. • Area of the ELC Vegetation Type polygon is the SWH. • SWHMIST[cxlix] Index #37 provides development effects and mitigation measures.	No rare vegetation communities were identified in the subject property or study area during the preliminary site investigation.	

Significant Wildlife Habitat Assessment Tables

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E (MNRF 2015)

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Waterfowl Nesting Area					Possible	Not Present
Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant	American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard	All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SWT1 SWT2 SWD1 SWD2 SWD3 SWD4 **Note: includes adjacency to Provincially Significant Wetlands**	A waterfowl nesting area extends: 120m[cxlix] from a wetland (>0.5ha) or a wetland (>0.5ha) with small wetlands (0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120m of each individual wetland where waterfowl nesting is known to occur[cxlix]. • Upland areas should be at least 120m wide so that predators such as racoons, skunks, and foxes have difficulty finding nests. • Wood Ducks and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites. <u>Information Sources</u> • Ducks Unlimited staff may know the locations of particularly productive nesting sites. • OMNRF Wetland Evaluations for indication of significant waterfowl nesting habitat. • Reports and other information available from CAs	Studies confirmed: • Presence of 3 or more nesting pairs for listed species excluding Mallards[í], or, • Presence of 10 or more nesting pairs for listed species including Mallards[í]. • Any active nesting site of an American Black Duck is considered significant. • Nesting studies should be completed during the spring breeding season (April - June). Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • A field study confirming waterfowl nesting habitat will determine the boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120m[cxlviii] from the wetland and will provide enough habitat for waterfowl to successfully nest. • SWHMIST[cxlix] Index #25 provides development effects and mitigation measures.	Open aquatic features and adjacent upland habitat within the subject property are expected to be too disturbed to support waterfowl nesting. Waterfowl may utilize wetlands within the study area.	

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E (MNRF 2015)

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Bald Eagle and Osprey Nesting, Foraging and Perching Habitat					Possible	Not Present
Nest sites are fairly uncommon in Ecoregion 7E and are used annually by these species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat.	Osprey <u>Special Concern</u>: Bald Eagle	ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands.	Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy. Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms). <u>Information Sources</u> • Natural Heritage Information Center (NHIC) compiles all known nesting sites for Bald Eagles in Ontario • MNRF values information (LIO/NRVIS) will list known nesting locations, Note: data from NRVIS is provided as a point format and does not include all the habitat. • Nature Counts, Ontario Nest Records Scheme data • OMNRF Districts • Check the Ontario Breeding Bird Atlas[ccv] or Rare Breeding Birds in Ontario for species documented • Reports and other information available from CAs • Field naturalists clubs	Studies confirm the use of these nests by: • One or more active Osprey or Bald Eagle nests in an area[cxlviii]. • Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH. • For an Osprey, the active nest and a 300m radius around the nest or the contiguous woodland stand is the SWH[ccvii], maintaining undisturbed shorelines with large trees within this area is important[cxlviii]. • For a Bald Eagle the active nest and a 400-800m radius around the nest is the SWH[cvi, ccvii]. Area of the habitat from 400-800m is dependant on site lines from the nest to the development and inclusion of perching and foraging habitat[cvi]. • To be significant a site must be used annually. When found inactive, the site must be known to be inactive for <u>></u>3 years or suspected of not being used for >5 years before being considered not significant[ccvii]. • Observational studies to determine nest site use, perching sites and foraging areas need to be done from mid March to mid August. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMIST[cxlix] Index #26 provides development effects and mitigation measures.	Nests may be found on large trees near the banks of Kettle Creek in the study area. Suitable nesting habitat is not present on the subject property.	

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E (MNRF 2015)

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Woodland Raptor Nesting Habitat					Possible	Possible
Nests sites for these species are rarely identified; these area sensitive habitats are often used annually by these species.	Northern Goshawk Cooper's Hawk Sharp-shinned Hawk Red-shouldered Hawk Barred Owl Broad-winged Hawk	May be found in all forested ELC Ecosites. May also be found in SWC, SWM, SWD and CUP3	All natural or conifer plantation woodland/forest stands combined >30ha or with >4ha of interior habitat[lxxxviiii, lxxxix, xc, xci, xciii, xciv, xcv,xcvi, cxxxiii]. Interior habitat determined with a 200m buffer[cxlviii]. • Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Coopers hawk nest along forest edges sometimes on peninsulas or small off-shore islands. • In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest. <u>Information Sources</u> • OMNRF Districts • Check the Ontario Breeding Bird Atlas[ccv] or Rare Breeding Birds in Ontario for species documented. • Check data from Bird Studies Canada • Reports and other information available from CAs	Studies confirm: • Presence of 1 or more active nests from species list is considered significant[cxlviii]. • Red-shouldered Hawk and Northern Goshawk – A 400m radius around the nest or 28 ha of habitat is the SWH[ccvii].(the 28ha habitat area would be applied where optimal habitat is irregularly shaped around the nest) • Barred Owl – A 200m radius around the nest is the SWH[ccvii]. • Broad-winged Hawk and Coopers Hawk – A 100m radius around the nest is the SWH[ccvii]. • Sharp-Shinned Hawk – A 50m radius around the nest is the SWH[ccvii]. • Conduct field investigations from early March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area. • SWHMIST[cxlix] Index #27 provides development effects and mitigation measures.	Forests within the study area contain suitable interior habitat to support woodland raptor nesting. No stick nests were observed in continguous forest habitat on the subject property during the preliminary site investigation.	
Wildlife Habitat: Turtle Nesting Area					Candidate	Candidate
These habitats are rare and when identified will often be the only breeding site for local populations of turtles.	Midland Painted Turtle <u>Special Concern</u>: Northern Map Turtle Snapping Turtle	Exposed mineral soil (sand or gravel) areas adjacent (<100m)[cxlviii] or within the following ELC Ecosites: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 BOO1 FEO1	• Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. • For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. • Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used. <u>Information Sources</u> • Use Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels). • Check the Ontario Herpetofaunal Summary Atlas records or other similar atlases for uncommon turtles; location information may help to find potential nesting habitat for them. • Natural Heritage Information Center (NHIC) Field naturalist clubs	Studies confirm: • Presence of 5 or more nesting Midland Painted Turtles[l] • One or more Northern Map Turtle or Snapping Turtle nesting is a SWH[l] • The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100m around the nesting area dependant on slope, riparian vegetation and adjacent land use is the SWH[cxlviii]. • Travel routes from wetland to nesting area are to be considered within the SWH as part of the 30-100m area of habitat[cxlix]. • Field investigations should be conducted in prime nesting season typically late spring to early summer. Observation studies observing the turtles nesting is a recommended method. • SWHMIST[cxlix] Index #28 provides development effects and mitigation measures for turtle nesting habitat.	Edges of ponds and the watercourse within the study area may provide nesting habitat for turtles. Sand traps within the golf course may also be utilized by turtles for nesting.	

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E (MNRF 2015)

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Seeps and Springs					Possible	Not Present
Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams	Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer Salamander spp.	Seeps/Springs are areas where ground water comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system[cxvii, cxlix]. • Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species[cxix, cxx, cxxi, cxxii, cxiii, cxiv]. <u>Information Sources</u> • Topographical Map • Thermography • Hydrological surveys conducted by CAs and MOE • Field naturalists and landowners • Municipalities and Conservation Authorities may have drainage maps and headwater areas mapped	Field Studies confirm: • Presence of a site with 2 or more[i] seeps/springs should be considered SWH. • The area of a ELC forest ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation of the habitat[cxlviii]. • SWHMIST[cxlix] Index #30 provides development effects and mitigation measures.	Seeps and springs may be found within forest communities in the study area. These features were not observed during the preliminary site investigation.	
Wildlife Habitat: Amphibian Breeding Habitat (Woodland)					Candidate	Candidate
These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians.	• Presence of a wetland, pond or woodland pool (including vernal pools) >500m^2 (about 25m diameter) [ccvii] within or adjacent (within 120m) to a woodland (no minimum size)[clxxxii, lxiii, lxv, lxvi, lxvii, lxviii, lxix, lxx]. Some small wetlands may not be mapped and may be important breeding pools for amphibians. • Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat[cxlviii]. <u>Information Sources</u> • Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records • Local landowners may also provide assistance as they may hear spring-time choruses of amphibians on their property. • OMNRF Districts and wetland evaluations • Field naturalist clubs • Canadian Wildlife Service Amphibian Road Call Survey • Ontario Vernal Pool Association: http://www.ontariovernalpools.org	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog/toad species with Call Level Codes of 3. • A combination of observational study and call count surveys [cviii] will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands. • The habitat is the wetland area plus a 230m radius of woodland area[lxiii, lxv, lxvi, lxvii, lxviii, lxix, lxx, lxxi]. If a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is to be included in the habitat. • SWHMIST[cxlix] Index #14 provides development effects and mitigation measures.	Pools and wetlands may be present within the forest communities in the study area. The pond and watercourse within the study area may also provide sufficient habitat and are within 120m of forest communities.	

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E (MNRF 2015)

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Amphibian Breeding Habitat (Wetland)					Not Present	Candidate
Wetlands supporting breeding for these amphibian species are extremely important and fairly rare within Central Ontario Landscapes	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	ELC Community Classes SW, MA, FE, BO, OA and SA. Typically these wetland ecosites will be isolated (>120m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (e.g. Bull Frog) may be adjacent to woodlands.	• Wetlands >500m^2 (about 25m diameter)[ccvii] supporting high species diversity are significant: some small or ephemeral habitats may not be identified on MNR mapping and could be important amphibian breeding habitats[clxxxiv]. • Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. • Bullfrogs require permanent water bodies with abundant emergent vegetation. <u>Information Sources</u> • Ontario Herpetofaunal Summary Atlas (or other similar atlases) • Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count. • OMNRF Districts and wetland evaluations • Reports and other information available from CAs	Studies confirm: • Presence of breeding population of 1or more of the listed newt/salamander species or 2 or more of the listed frog or toad species and with at least 20 breeding individuals (adults and eggs masses)[lxxi, lxxiii] or 2 or more of the listed frog/toad species with Call Level of 3. or; Wetland with confirmed breeding Bullfrogs are significant[í]. • The ELC ecosite wetland area and the shoreline are the SWH. • A combination of observational study and call count surveys cviii to determine breeding/larval stages will be required during the spring (May March-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands. • If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHMIST[cxlix] Index #15 provides development effects and mitigation measures.	While disturbed, amphibians may utilize golf ponds within the subject property for breeding.	
Wildlife Habitat: Woodland Area-Sensitive Bird Breeding Habitat					Possible	Not Present
Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest song birds.	Yellow-bellied Sapsucker Red-breasted Nuthatch Veery Blue-headed Vireo Northern Parula Black-throated Green Warbler Blackburnian Warbler Black-throated Blue Warbler Ovenbird Scarlet Tanager Winter Wren Pileated Woodpecker <u>Special Concern</u>: Cerulean Warbler Canada Warbler	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD	• Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs. old) forest stands or woodlots >30ha[cv, cxxxi, cxxxii, cxxxiii, cxxxiv, cxxxv, cxxxvi, cxxxvii, cxxxviii, cxxxix, cxl, cxli, cxlii, cxliii, cxliv, cxlv, cxlvi, cl, cli, clii, cliii, cliv, clv, clvi, clvii, clviii, clix]. • Interior forest habitat is at least 200m from forest edge habitat[clxiv]. <u>Information Sources</u> • Local birder clubs • Canadian Wildlife Service (CWS) for the location of forest bird monitoring • Bird Studies Canada conducted a 3-year study of 287 woodlands to determine the effects of forest fragmentation on forest birds and to determine what forests were of greatest value to interior species. • Reports and other information available from CAs	Studies confirm: • Presence of nesting or breeding pairs of 3 or more of the listed wildlife species[í]. • Note: any site with breeding Cerulean Warblers or Canada Warbler is to be considered SWH[í]. • Conduct field investigations in early summer when birds are singing and defending their territories. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMIST[cxlix] Index #34 provides development effects and mitigation measures.	Forest communities in the study area are of suitable size to support these species.	

Significant Wildlife Habitat Assessment Tables

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 7E (MNRF 2015)

	Candidate SWH			Confirmed SWH	Assessment Details	
Rationale	**Wildlife Species**	**ELC Ecosite Codes**	**Habitat Criteria and Information Sources**	**Defining Criteria**	**Study Area**	**Subject Property**
Wildlife Habitat: Marsh Bird Breeding Habitat					Possible	Not Present
Wetlands for these bird species are typically productive and fairly rare in Southern Ontario landscapes.	American Bittern Virginia Rail Sora Common Gallinule American Coot Pied-billed Grebe Marsh Wren Sedge Wren Common Loon Green Heron Trumpeter Swan <u>Special Concern</u>: Black Tern Yellow Rail	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SAS1 SAM1 SAF1 FEO1 BOO1 For Green Heron: All SW, MA and CUM1 sites	• Nesting occurs in wetlands • All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present[cxxiv]. • For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water. <u>Information Sources</u> • OMNRF Districts and wetland evaluations • Field naturalist clubs • Natural Heritage Information Centre (NHIC) • Reports and other information available from CAs • Ontario Breeding Bird Atlas[ccv]	Studies confirm: • Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or breeding by any combination of 4 or more of the listed species[i]. • Note: any wetland with breeding of 1 or more Trumpeter Swans, Black Terns, Green Heron or Yellow Rail is SWH[i]. • Area of the ELC ecosite is the SWH • Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”[ccxi] • SWHMIST[cxlix] Index #35 provides development effects and mitigation measures	Wetlands within the study area may support marsh bird breeding. Ponds within the golf course are expected to lack suitable vegetative cover.	
Wildlife Habitat: Open Country Bird Breeding Habitat					Not Present	Not Present
This wildlife habitat is declining throughout Ontario and North America. Species such as the Upland Sandpiper have declined significantly the past 40 years based on CWS (2004) trend records.	Upland Sandpiper Grasshopper Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow <u>Special Concern</u>: Short-eared Owl	CUM1 CUM2	Large grassland areas (includes natural and cultural fields and meadows) >30ha[clx, clxi, clxii, clxiii, clxiv, clxv, clxvi, clxvii, clxviii, clxix]. Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e. no row cropping or intensive hay or livestock pasturing in the last 5 years)[i]. Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older. The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species. <u>Information Sources</u> • Agricultural land classification maps Ministry of Agriculture • Local birder clubs • Ontario Breeding Bird Atlas[ccv] • EIS Reports and other information available from CAs	Field Studies confirm: • Presence of nesting or breeding of 2 or more of the listed species[i]. • A field with 1 or more breeding Short-eared Owls is to be considered SWH. • The area of SWH is the contiguous ELC ecosite field areas. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”[ccxi] • SWHMIST[cxlix] Index #32 provides development effects and mitigation measures	The subject property and study area lack grassland habitat. Agricultural fields within the study area are active and unsuitable.	

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 7E (MNRF 2015)

	Candidate SWH			Confirmed SWH	Assessment Details	
Rationale	**Wildlife Species**	**ELC Ecosite Codes**	**Habitat Criteria and Information Sources**	**Defining Criteria**	**Study Area**	**Subject Property**
Wildlife Habitat: Shrub/Early Successional Bird Breeding Habitat					Not Present	Not Present
This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined significantly over the past 40 years based on CWS (2004) trend records.	Indicator Spp: Brown Thrasher Clay-coloured Sparrow Common Spp. Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher <u>Special Concern</u>: Yellow-breasted Chat Golden-winged Warbler	CUT1 CUT2 CUS1 CUS2 CUW1 CUW2 Patches of shrub ecosites can be complexed into a larger habitat such as woodland area for some bird species.	Large natural field areas succeeding to shrub and thicket habitats >10ha[clxiv] in size. Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (i.e. no row-cropping, haying or live-stock pasturing in the last 5 years)[í]. Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species[clxxiii]. Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands. <u>Information Sources</u> • Agricultural land classification maps, Ministry of Agriculture. • Local bird clubs • Ontario Breeding Bird Atlas[ccv] • Reports and other information available from CAs	Field Studies confirm: • Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species[í]. • A field with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat[í]. • The area of the SWH is the contiguous ELC ecosite field/thicket area. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”[ccxi] • SWHMIST[cxlix] Index #33 provides development effects and mitigation measures.	The subject property and study area do not contain shrub and thicket habitat >10ha. Agricultural fields within the study area are active and unsuitable.	
Wildlife Habitat: Terrestrial Crayfish					Possible	Not Present
Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats are very rare. [Ccii]	Chimney or Digger Crayfish (*Fallicambarus fodiens*) Devil Crawfish or Meadow Crayfish (*Cambarus Diogenes*)	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 MAS1 MAS2 MAS3 SWD SWT SWM CUM1 with inclusions of above meadow marsh ecosites can be used by terrestrial crayfish.	Wet meadow and edges of shallow marshes (no minimum size) identified should be surveyed for terrestrial crayfish. • Constructs burrows in marshes, mudflats, meadows, the ground can’t be too moist. Can often be found far from water. • Both species are a semi-terrestrial burrower which spends most of its life within burrows consisting of a network of tunnels. Usually the soil is not too moist so that the tunnel is well formed. <u>Information Sources</u> • Information sources from “Conservation Status of Freshwater Crayfishes” by Dr. Premek Hamr for the WWF and CNF March 1998.	Studies Confirm: • Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable marsh meadow or terrestrial sites[cci]. • Area of ELC Ecosite or an ecoelement area of meadow marsh or swamp within the large ecosite area is the SWH • Surveys should be done April to August in temporary or permanent water. Note the presence of burrows or chimneys are often the only indicator of presence, observance or collection of individuals is very difficult [cci] • SWHMIST[cxlix] Index #36 provides development effects and mitigation measures.	Terrestrial crayfish chimneys may be found in agricultural fields within the study area.	

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 7E (MNRF 2015)

	Candidate SWH			Confirmed SWH	Assessment Details	
Rationale	**Wildlife Species**	**ELC Ecosite Codes**	**Habitat Criteria and Information Sources**	**Defining Criteria**	**Study Area**	**Subject Property**
Wildlife Habitat: Special Concern and Rare Wildlife Species					Possible	Possible
These species are quite rare or have experienced significant population declines in Ontario	All Special Concern and Provincially Rare (S1-S3, SH) plant and animal species. Lists of these species are tracked by the Natural Heritage Information Centre (NHIC).	All plant and animal element occurrences (EO) within a 1 or 10km grid. Older element occurrences were recorded prior to GPS being available, therefore location information may lack accuracy.	When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or provincially Rare species; linking candidate habitat on the site needs to be completed to ELC Ecosites[lxxviii]. <u>Information Sources</u> • Natural Heritage Information Centre (NHIC) will have the Special Concern and Provincially Rare (S1-S3, SH) species lists and element occurrences for these species. • NHIC Website: "Get Information" http://nhic.mnr.gov.on.ca • Ontario Breeding Bird Atlas[ccv] • Expert advice should be sought as many of the rare spp. have little information available about their requirements.	Studies Confirm: • Assessment/inventory of the site for the identified special concern or rare species needs to be completed during the time of year when the species is present or easily identifiable. • The area of the habitat to the finest ELC scale that protects the habitat form and function is the SWH, this must be delineated through detailed field studies. The habitat neess to be easily mapped and cover an important life stage component for a species e.g. specific nesting habitat for foraging habitat. • SWHMIST[cxlix] Index #37 provides development effects and mitigation measures.	Several special concern and rare wildlife species have been reported from the area. Field surveys will confirm the presence of suitable habitat for these species.	

Significant Wildlife Habitat Assessment Tables

Table 5. Characteristics of Animal Movement Corridors for Ecoregion 7E (MNRF 2015)

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Amphibian Movement Corridors					Possible	Possible
Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.	Eastern Newt American Toad Blue-spotted Salamander Spotted Salamander Four-toed Salamander Gray Treefrog Northern Leopard Frog Pickerel Frog Western Chorus Frog	Corridors may be found in all ecosites associated with water. • Corridors will be determined based on identifying the significant breeding habitat for these species in Table 1.1.	Movement corridors between breeding habitat and summer habitat[clxxiv, clxxv, clxxvi, clxxvii, clxxviii, clxxix, clxxx, clxxxi] Movement corridors must be considered when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2 (Amphibian Breeding Habitat – Wetland) of this Schedule[i]. <u>Information Sources</u> • MNRF District Office • Natural Heritage Information Centre NHIC • Reports and other information available from CAs • Field naturalist Clubs	• Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites. • Corridors should consist of native vegetation, with several layers of vegetation. Corridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant[cxlix]. • Corridors should have at least 15m of vegetation on both sides of waterwaycxlix or be up to 200m widecxlix of woodland habitat and with gaps <20m[cxlix] • Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat[cxlix]. • SWHMIST[cxlix] Index #40 provides development effects and mitigation measures.	Breeding pools may be present within the forest communities found in the study area, and connected to other habitats via these treed corridors. The riparian zone along the watercourse may also provide a movement corridior for amphibians. Anuran call surveys will confirm breeding activity in these wetlands and potential pools.	

Significant Wildlife Habitat Assessment Tables

Table 6. Exceptions for Ecodistricts within Ecoregion 7E-2 (MNRF 2015)

	Candidate SWH			Confirmed SWH	Assessment Details	
Rationale	**Wildlife Species**	**Ecosites**	**Habitat Criteria and Information Sources**	**Defining Criteria**	**Study Area**	**Subject Property**
Bat Migratory Stopover Area					Not Present	Not Present
Stopover areas for long distance migrant bats are important during fall migration.	Hoary Bat Eastern Red Bat Silver-haired Bat	No specific ELC types	• Long distance migratory bats typically migrate during late summer and early fall migrating summer breeding habitats throughout Ontario to southern wintering areas. Their annual fall migration may concentrate these species of bats at stopover areas. • This is the only known bat migratory stopover habitats based on current information. <u>Information Sources</u> • OMNRF for possible locations and contact for local experts • University of Waterloo, Biology Department	• Long Point (42°35'N, 80°30'E, to 42°33'N, 80°03'E) has been identified as a significant stop-over habitat for fall migrating Silver-haired bats, due to significant increases in abundance, activity and feeding that was documented during fall migration[ccxv]. • The confirmation criteria and habitat areas for this SWH are still being determined. • SWHMIST[cxlix] Index #38 provides development effects and mitigation measures	This subject property and study area occur outside of the known stopover habitat for bats.	

Appendix IV
Vascular Flora and Wildlife Species Lists

Bird Species Reported from the Study Area - Kettle Creek GC, Port Stanley (Project #2982)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	OBBA*	NHIC Data**
		MNRF 2022a	MECP 2022	Government of Canada 2022	Government of Canada 2022	Government of Canada 2022	BSC et al. 2006	MNRF 2022b
Anatidae	**Ducks, Geese & Swans**							
Aix sponsa	Wood Duck	S5B,S3N					CO	
Anas platyrhynchos	Mallard	S5					CO	
Anas rubripes	American Black Duck	S4					CO	
Branta canadensis	Canada Goose	S5					CO	
Lophodytes cucullatus	Hooded Merganser	S5					PR	
Oxyura jamaicensis	Ruddy Duck	S3B,S4N,S5M					CO	
Spatula discors	Blue-winged Teal	S3B,S4M					CO	
Odontophoridae	**New World Quails**							
Colinus virginianus	Northern Bobwhite	S1?	END	E	E	Schedule 1	PR	X
Phasianidae	**Partridges, Grouse & Turkeys**							
Bonasa umbellus	Ruffed Grouse	S5					PR	
Meleagris gallopavo	Wild Turkey	S5					CO	
Columbidae	**Pigeons & Doves**							
Columba livia	Rock Pigeon	SNA					CO	
Zenaida macroura	Mourning Dove	S5					CO	
Cuculiformes	**Cuckoos & Anis**							
Coccyzus americanus	Yellow-billed Cuckoo	S4B					PR	
Coccyzus erythropthalmus	Black-billed Cuckoo	S4S5B					CO	
Apodidae	**Swifts**							
Chaetura pelagica	Chimney Swift	S3B	THR	T	T	Schedule 1	PR	
Trochilidae	**Hummingbirds**							
Archilochus colubris	Ruby-throated Hummingbird	S5B					CO	
Rallidae	**Rails, Gallinules & Coots**							
Porzana carolina	Sora	S5B					PO	
Rallus limicola	Virginia Rail	S4S5B					PR	
Charadriidae	**Plovers & Lapwings**							
Charadrius vociferus	Killdeer	S4B					CO	
Scolopacidae	**Sandpipers & Allies**							
Actitis macularia	Spotted Sandpiper	S5B					CO	
Scolopax minor	American Woodcock	S4B					CO	
Ardeidae	**Herons & Bitterns**							
Ardea herodias	Great Blue Heron	S4					PO	
Butorides virescens	Green Heron	S4B					CO	
Cathartidae	**Vultures**							
Cathartes aura	Turkey Vulture	S5B,S3N					PO	
Accipitridae	**Hawks, Kites, Eagles & Allies**							
Accipiter cooperii	Cooper's Hawk	S4	NAR	NAR	NS	No schedule	PR	
Accipiter striatus	Sharp-shinned Hawk	S5	NAR	NAR	NS	No schedule	PR	
Buteo jamaicensis	Red-tailed Hawk	S5	NAR	NAR	NS	No schedule	CO	
Circus hudsonius	Northern Harrier	S5B,S4N	NAR	NAR	NS	No schedule	CO	
Strigidae	**Typical Owls**							
Bubo virginianus	Great Horned Owl	S4					CO	
Megascops asio	Eastern Screech-Owl	S4	NAR	NAR	NS	No schedule	CO	

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	OBBA*	NHIC Data**
		MNRF 2022a	MECP 2022	Government of Canada 2022	Government of Canada 2022	Government of Canada 2022	BSC et al. 2006	MNRF 2022b
Alcedinidae	**Kingfishers**							
Megaceryle alcyon	Belted Kingfisher	S5B,S4N					CO	
Picidae	**Woodpeckers**							
Colaptes auratus	Northern Flicker	S5					CO	
Dryobates pubescens	Downy Woodpecker	S5					CO	
Dryobates villosus	Hairy Woodpecker	S5					CO	
Dryocopus pileatus	Pileated Woodpecker	S5					CO	
Melanerpes carolinus	Red-bellied Woodpecker	S5					CO	
Melanerpes erythrocephalus	Red-headed Woodpecker	S3	END	E	E	Schedule 1	CO	
Sphyrapicus varius	Yellow-bellied Sapsucker	S5B,S3N					CO	
Falconidae	**Caracaras & Falcons**							
Falco sparverius	American Kestrel	S4					CO	
Tyrannidae	**Tyrant Flycatchers**							
Contopus virens	Eastern Wood-Pewee	S4B	SC	SC	SC	Schedule 1	PR	
Empidonax minimus	Least Flycatcher	S5B					PR	
Empidonax traillii	Willow Flycatcher	S4B					CO	
Empidonax virescens	Acadian Flycatcher	S1B	END	E	E	Schedule 1	CO	
Myiarchus crinitus	Great Crested Flycatcher	S5B					CO	
Sayornis phoebe	Eastern Phoebe	S5B					CO	
Tyrannus tyrannus	Eastern Kingbird	S4B					CO	
Vireonidae	**Vireos**							
Vireo flavifrons	Yellow-throated Vireo	S4B					CO	
Vireo gilvus	Warbling Vireo	S5B					CO	
Vireo olivaceus	Red-eyed Vireo	S5B					CO	
Corvidae	**Crows & Jays**							
Corvus brachyrhynchos	American Crow	S5					CO	
Cyanocitta cristata	Blue Jay	S5					CO	
Alaudidae	**Larks**							
Eremophila alpestris	Horned Lark	S4					CO	
Hirundinidae	**Swallows**							
Hirundo rustica	Barn Swallow	S4B	SC	SC	T	Schedule 1	CO	X
Petrochelidon pyrrhonota	Cliff Swallow	S4S5B					CO	
Progne subis	Purple Martin	S3B					CO	
Riparia riparia	Bank Swallow	S4B	THR	T	T	Schedule 1	CO	
Stelgidopteryx serripennis	Northern Rough-winged Swallow	S4B					CO	
Tachycineta bicolor	Tree Swallow	S4S5B					CO	
Paridae	**Chickadees & Titmice**							
Baeolophus bicolor	Tufted Titmouse	S3					CO	
Poecile atricapillus	Black-capped Chickadee	S5					CO	
Sittidae	**Nuthatches**							
Sitta canadensis	Red-breasted Nuthatch	S5					PR	
Sitta carolinensis	White-breasted Nuthatch	S5					CO	
Certhiidae	**Creepers**							
Certhia americana	Brown Creeper	S5					PR	
Troglodytidae	**Wrens**							
Thryothorus ludovicianus	Carolina Wren	S4					CO	
Troglodytes aedon	House Wren	S5B					CO	
Troglodytes hiemalis	Winter Wren	S5B,S4N					PR	

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	OBBA*	NHIC Data**
		MNRF 2022a	MECP 2022	Government of Canada 2022	Government of Canada 2022	Government of Canada 2022	BSC et al. 2006	MNRF 2022b
Polioptilidae	**Gnatcatchers**							
Polioptila caerulea	Blue-gray Gnatcatcher	S4B					CO	
Turdidae	**Thrushes**							
Catharus fuscescens	Veery	S5B					PR	
Hylocichla mustelina	Wood Thrush	S4B	SC	T	T	Schedule 1	CO	
Sialia sialis	Eastern Bluebird	S5B,S4N	NAR	NAR	NS	No schedule	CO	
Turdus migratorius	American Robin	S5					CO	
Mimidae	**Mockingbirds, Thrashers & Allies**							
Dumetella carolinensis	Gray Catbird	S5B,S3N					CO	
Mimus polyglottos	Northern Mockingbird	S4					PR	
Toxostoma rufum	Brown Thrasher	S4B					CO	
Sturnidae	**Starlings**							
Sturnus vulgaris	European Starling	SNA					CO	
Bombycillidae	**Waxwings**							
Bombycilla cedrorum	Cedar Waxwing	S5					CO	
Passeridae	**Old World Sparrows**							
Passer domesticus	House Sparrow	SNA					CO	
Fringillidae	**Finches & Allies**							
Haemorhous mexicanus	House Finch	SNA					CO	
Spinus tristis	American Goldfinch	S5					CO	
Emberizidae	**New World Sparrows & Allies**							
Melospiza georgiana	Swamp Sparrow	S5B,S4N					CO	
Melospiza melodia	Song Sparrow	S5					CO	
Passerculus sandwichensis	Savannah Sparrow	S5B,S3N					CO	
Pipilo erythrophthalmus	Eastern Towhee	S4B,S3N					CO	
Pooecetes gramineus	Vesper Sparrow	S4B					CO	
Spizella passerina	Chipping Sparrow	S5B,S3N					CO	
Spizella pusilla	Field Sparrow	S4B,S3N					CO	
Zonotrichia albicollis	White-throated Sparrow	S5					PO	
Icteridae	**Troupials & Allies**							
Agelaius phoeniceus	Red-winged Blackbird	S5					CO	
Dolichonyx oryzivorus	Bobolink	S4B	THR	SC	T	Schedule 1	CO	
Icterus galbula	Baltimore Oriole	S4B					CO	
Icterus spurius	Orchard Oriole	S4B					CO	
Molothrus ater	Brown-headed Cowbird	S5					CO	
Quiscalus quiscula	Common Grackle	S5					CO	
Sturnella magna	Eastern Meadowlark	S4B,S3N	THR	T	T	Schedule 1	CO	
Parulidae	**Wood Warblers**							
Geothlypis philadelphia	Mourning Warbler	S5B					PR	
Geothlypis trichas	Common Yellowthroat	S5B,S3N					CO	
Parkesia motacilla	Louisiana Waterthrush	S2B	THR	T	T	Schedule 1	CO	
Seiurus aurocapilla	Ovenbird	S5B					PR	
Setophaga pensylvanica	Chestnut-sided Warbler	S5B					PR	
Setophaga petechia	Yellow Warbler	S5B					CO	
Setophaga pinus	Pine Warbler	S5B,S3N					CO	
Setophaga ruticilla	American Redstart	S5B					PR	
Vermivora cyanoptera	Blue-winged Warbler	S4B					PR	

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	OBBA*	NHIC Data**
		MNRF 2022a	MECP 2022	Government of Canada 2022	Government of Canada 2022	Government of Canada 2022	BSC et al. 2006	MNRF 2022b
Cardinalidae	**Cardinals, Grosbeaks & Allies**							
Cardinalis cardinalis	Northern Cardinal	S5					CO	
Passerina cyanea	Indigo Bunting	S5B					CO	
Pheucticus ludovicianus	Rose-breasted Grosbeak	S5B					CO	
Piranga olivacea	Scarlet Tanager	S5B					CO	
Total							**107**	**2**

*OBBA Atlas Square: 17MH82

**NHIC Atlas Square: 17MH8124

Bird Breeding Evidence Codes	
OB	Observed
PO	Possible
PR	Probable
CO	Confirmed

References

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Reptile and Amphibian Species Reported from the Study Area - Kettle Creek GC, Port Stanley (Project #2982)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	ORAA*	NHIC Data**
		MNRF 2022a	MECP 2022	Government of Canada 2022	Government of Canada 2022	Government of Canada 2022	Ontario Nature 2019	MNRF 2022b
Turtles								
Apalone spinifera	Spiny Softshell	S2	END	E	E	Schedule 1		X
Chelydra serpentina	Snapping Turtle	S4	SC	SC	SC	Schedule 1	X	
Chrysemys picta marginata	Midland Painted Turtle	S4		SC	SC	Schedule 1	X	
Snakes								
Lampropeltis triangulum	Milksnake	S4	NAR	SC	SC	Schedule 1	X	
Nerodia sipedon sipedon	Northern Watersnake	S5	NAR	NAR	NS	No schedule	X	
Sistrurus catenatus pop. 2	Massasauga (Carolinian population)	S1	END	E	E	Schedule 1	X	
Storeria dekayi	Dekay's Brownsnake	S5	NAR	NAR	NS	No schedule	X	
Thamnophis sauritus septentrionalis	Northern Ribbonsnake	S4	SC	SC	SC	Schedule 1	X	
Thamnophis sirtalis sirtalis	Eastern Gartersnake	S5					X	
Salamanders								
Ambystoma maculatum	Spotted Salamander	S4					X	
Notophthalmus viridescens viridescens	Red-spotted Newt	S5					X	
Plethodon cinereus	Eastern Red-backed Salamander	S5					X	
Frogs and Toads								
Anaxyrus americanus	American Toad	S5					X	
Dryophytes versicolor	Gray Treefrog	S5					X	
Pseudacris crucifer	Spring Peeper	S5					X	
Lithobates catesbeianus	American Bullfrog	S4					X	
Lithobates clamitans	Green Frog	S5					X	
Lithobates pipiens	Northern Leopard Frog	S5	NAR	NAR	NS	No schedule	X	
Lithobates sylvaticus	Wood Frog	S5					X	
Total							**18**	**1**

*ORAA Atlas Square: 17MH82

**NHIC Atlas Square: 17MH8124

References

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Mammal Species Reported from the Study Area - Kettle Creek GC, Port Stanley (Project #2982)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Ontario Mammal Atlas	NHIC Data**
		MNRF 2022a	MECP 2022	Government of Canada 2022	Government of Canada 2022	Government of Canada 2022	Dobbyn 1994	MNRF 2022b
Didelphimorphia	**Opossums**							
Didelphis virginiana	Virginia Opossum	S4					X	
Eulipotyphla	**Shrews, Moles, Hedgehogs, and Allies**							
Blarina brevicauda	Northern Short-tailed Shrew	S5					X	
Condylura cristata	Star-nosed Mole	S5					X	
Parascalops breweri	Hairy-tailed Mole	S4					X	
Sorex cinereus	Masked Shrew	S5					X	
Sorex fumeus	Smoky Shrew	S5					X	
Sorex hoyi	Pygmy Shrew	S4					X	
Sorex palustris	Water Shrew	S5					X	
Chiroptera	**Bats**							
Eptesicus fuscus	Big Brown Bat	S4					X	
Lasionycteris noctivagans	Silver-haired Bat	S4					X	
Lasiurus borealis	Eastern Red Bat	S4					X	
Lasiurus cinereus	Hoary Bat	S4					X	
Myotis leibii	Eastern Small-footed Myotis	S2S3	END				X	
Myotis septentrionalis	Northern Myotis	S3	END	E	E	Schedule 1	X	
Lagomorpha	**Rabbits and Hares**							
Lepus americanus	Snowshoe Hare	S5					X	
Lepus europaeus	European Hare	SNA					X	
Sylvilagus floridanus	Eastern Cottontail	S5					X	
Rodentia	**Rodents**							
Castor canadensis	Beaver	S5					X	
Erethizon dorsatum	Porcupine	S5					X	
Glaucomys volans	Southern Flying Squirrel (Great Lakes Pla	S4	NAR	NAR	NS	No schedule	X	
Marmota monax	Woodchuck	S5					X	
Microtus pennsylvanicus	Meadow Vole	S5					X	
Microtus pinetorum	Woodland Vole	S3?	SC	SC	SC	Schedule 1	X	
Mus musculus	House Mouse	SNA					X	
Napaeozapus insignis	Woodland Jumping Mouse	S5					X	
Ondatra zibethicus	Muskrat	S5					X	
Peromyscus leucopus	White-footed Mouse	S5					X	
Peromyscus maniculatus	Deer Mouse	S5					X	
Rattus norvegicus	Norway Rat	SNA					X	
Sciurus carolinensis	Eastern Gray Squirrel	S5					X	
Synaptomys cooperi	Southern Bog Lemming	S4					X	
Tamias striatus	Eastern Chipmunk	S5					X	
Tamiasciurus hudsonicus	Red Squirrel	S5					X	
Zapus hudsonius	Meadow Jumping Mouse	S5					X	
Canidae	**Canines**							
Canis latrans	Coyote	S5					X	
Vulpes vulpes	Red Fox	S5					X	
Felidae	**Felines**							
Lynx canadensis	Canada Lynx	S5	NAR	NAR	NS	No schedule	X	
Mephitidae	**Skunks and Stink Badgers**							
Mephitis mephitis	Striped Skunk	S5					X	

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Ontario Mammal Atlas	NHIC Data**
		MNRF 2022a	MECP 2022	Government of Canada 2022	Government of Canada 2022	Government of Canada 2022	Dobbyn 1994	MNRF 2022b
Mustelidae	**Weasels and Allies**							
Mustela frenata	Long-tailed Weasel	S4					X	
Mustela richardsonii	American Ermine	S5					X	
Neovison vison	American Mink	S4					X	
Taxidea taxus jacksoni	American Badger (Southwestern Ontario	S1	END	E	E	Schedule 1	X	
Procyonidae	**Raccoons and Allies**							
Procyon lotor	Northern Raccoon	S5					X	
Artiodactyla	**Deer and Bison**							
Cervus elaphus	Elk	SNA					X	
Odocoileus virginianus	White-tailed Deer	S5					X	
Total							**45**	**0**

*Mammal Atlas Square Numbers: 17MT82
**NHIC Atlas Squares: 17MH8124

References

Ministry of Natural Resources and Forestry (MNRF). 2022a. Natural Heritage Information Centre (NHIC): Species List for Ontario. Published: 2014-07-17. All Species List Updated: 2022-04-11. Available: https://www.ontario.ca/page/get-natural-heritage-information

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Plant Species Reported from the Study Area - Kettle Creek GC, Port Stanley (Project #2982)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Elgin	NHIC Data*	NRSI Observed	FOD5-2	CUP3-2	CUW1	CUT1-5	FOD 7	SWT2-2	CUP3-2	CUM1-1
		MNRF 2021	MECP 2022	Government of Canada 2021	Government of Canada 2021	Government of Canada 2021	Oldham 2017	MNRF 2022	NRSI Results From 2022								
Pteridophytes	**Ferns & Allies**																
Dryopteridaceae	**Wood Fern Family**																
Dryopteris carthusiana	Spinulose Wood Fern	S5					C		X		X	X					
Thelypteridaceae	**Beech Fern Family**																
Phegopteris hexagonoptera	Broad Beech Fern	S3		SC	SC	Schedule 3	U	X									
Gymnosperms	**Conifers**																
Pinaceae	**Pine Family**																
Picea abies	Norway Spruce	SE3							X		X						
Picea glauca	White Spruce	S5							X								X
Pinus strobus	Eastern White Pine	S5					U		X		X					X	
Dicotyledons	**Dicots**																
Aceraceae	**Maple Family**																
Acer negundo	Manitoba Maple	S5					C		X						X		
Acer platanoides	Norway Maple	SE5					IR		X							X	
Acer saccharum	Sugar Maple	S5					C		X	X			X	X			
Anacardiaceae	**Sumac or Cashew Family**																
Rhus typhina	Staghorn Sumac	S5					C		X	X	X		X		X		X
Toxicodendron radicans var. rydbergii	Western Poison Ivy	S5					X		X		X						X
Apiaceae	**Carrot or Parsley Family**																
Sanicula marilandica	Maryland Sanicle	S5					X		X	X							
Araliaceae	**Ginseng Family**																
Panax quinquefolius	American Ginseng	S2	END	E	E	Schedule 1	R	X									
Asteraceae	**Composite or Aster Family**																
Arctium minus	Common Burdock	SE5					IC		X		X		X				
Cirsium arvense	Creeping Thistle	SE5					IC		X						X		
Eupatorium perfoliatum	Common Boneset	S5					C		X				X				
Euthamia graminifolia	Grass-leaved Goldenrod	S5					C		X				X				X
Solidago altissima	Tall Goldenrod	S5							X								X
Solidago caesia	Blue-stemmed Goldenrod	S5					X		X	X							
Solidago canadensis	Canada Goldenrod	S5							X	X	X	X	X		X	X	
Sonchus arvensis	Field Sow-thistle	SE5					IX		X				X				
Symphyotrichum lanceolatum	Panicled Aster	S5					C		X	X			X		X		
Symphyotrichum lateriflorum	Calico Aster	S5					X		X	X	X		X	X		X	
Symphyotrichum novae-angliae	New England Aster	S5					C		X				X		X		
Symphyotrichum urophyllum	Arrow-leaved Aster	S4					X		x	x		X					
Tussilago farfara	Colt's-foot	SE5					IC		X				X		X		
Balsaminaceae	**Touch-me-not Family**																
Impatiens capensis	Spotted Jewelweed	S5					C		X	X					X		
Berberidaceae	**Barberry Family**																
Berberis thunbergii	Japanese Barberry	SE5					IU		X		X						
Betulaceae	**Birch Family**																
Betula alleghaniensis	Yellow Birch	S5					C		X	X			X				
Ostrya virginiana	Eastern Hop-hornbeam	S5					C		X	X							
Boraginaceae	**Borage Family**																
Hackelia virginiana	Virginia Stickseed	S5					X		X	X	X						
Brassicaceae	**Mustard Family**																
Alliaria petiolata	Garlic Mustard	SE5					IC		X	X	X	X	X			X	
Hesperis matronalis	Dame's Rocket	SE5					IC		X	X	X						
Cactaceae	**Cactus Family**																
Opuntia cespitosa	Eastern Prickly-pear Cactus	S1	END	E	E	Schedule 1	?	X									
Caprifoliaceae	**Honeysuckle Family**																
Sambucus racemosa	Red Elderberry	S5					X		X		X						
Viburnum opulus	Cranberry Viburnum	S5							X			X				X	
Cornaceae	**Dogwood Family**																
Cornus alternifolia	Alternate-leaved Dogwood	S5					X		X				X				
Cornus drummondii	Rough-leaved Dogwood	S4					U		X			X					
Cornus obliqua	Pale Dogwood	S5					X		X	X		X	X			X	
Cornus sericea	Red-osier Dogwood	S5					C		X	X			X		X		
Cucurbitaceae	**Gourd Family**																
Sicyos angulatus	One-seeded Bur-cucumber	S4S5					X		X	X							
Fagaceae	**Beech Family**																
Fagus grandifolia	American Beech	S4					C		X	X			X				
Gentianaceae	**Gentian Family**																
Gentianella quinquefolia	Stiff Gentian	S2					R	X									

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Elgin	NHIC Data*	NRSI Observed	FOD5-2	CUP3-2	CUW1	CUT1-5	FOD 7	SWT2-2	CUP3-2	CUM1-1
		MNRF 2021	MECP 2022	Government of Canada 2021	Government of Canada 2021	Government of Canada 2021	Oldham 2017	MNRF 2022	NRSI Results From 2022								
Grossulariaceae	**Currant Family**																
Ribes cynosbati	Prickly Gooseberry	S5					C		X	X	X						
Juglandaceae	**Walnut Family**																
Carya cordiformis	Bitternut Hickory	S5					C		X			X					
Carya ovata	Shagbark Hickory	S5					C		X	X							
Juglans cinerea	Butternut	S2?	END	E	E	Schedule 1	U	X									
Juglans nigra	Black Walnut	S4?					C		X	X		X	X	X			
Lamiaceae	**Mint Family**																
Glechoma hederacea	Ground Ivy	SE5					IX		X							X	
Oleaceae	**Olive Family**																
Fraxinus americana	White Ash	S4					C		X	X	X	X	X	X		X	
Fraxinus pennsylvanica	Green Ash	S4					C		X	X							
Ligustrum vulgare	European Privet	SE5					IR		X	X		X		X		X	
Oxalidaceae	**Wood Sorrel Family**																
Oxalis stricta	Upright Yellow Wood-sorrel	SE5					X		X	X							
Polygonaceae	**Smartweed Family**																
Polygonum erectum	Erect Knotweed	SH					H	X									
Rumex obtusifolius	Bitter Dock	SE5					IX		X	X	X		X				
Rhamnaceae	**Buckthorn Family**																
Rhamnus cathartica	Common Buckthorn	SE5					IC		X	X	X		X	X		X	X
Rosaceae	**Rose Family**																
Geum macrophyllum	Large-leaved Avens	S5					?		X	X	X	X					
Prunus avium	Sweet Cherry	SE4					IR		X	X							
Prunus serotina	Black Cherry	S5					C		X	X	X					X	
Pyrus communis	Common Pear	SE4					IX		X							X	
Rosa multiflora	Multiflora Rose	SE5					IX		X	X	X	X	X				
Rubus idaeus	Common Red Raspberry	S5							X	X	X		X				
Rubus odoratus	Purple-flowering Raspberry	S5					X		X	X			X				
Salicaceae	**Willow Family**																
Populus deltoides	Eastern Cottonwood	S5					C		X							X	X
Salix euxina	Crack Willow	SE					IX		X						X		
Salix interior	Sandbar Willow	S5					C		X						X		
Salix nigra	Black Willow	S4					X		X								X
Solanaceae	**Nightshade Family**																
Solanum dulcamara	Bittersweet Nightshade	SE5					IC		X	X	X		X				
Tiliaceae	**Linden Family**																
Tilia americana	American Basswood	S5					C		X				X				
Ulmaceae	**Elm Family**																
Ulmus americana	American Elm	S5					C		X							X	
Urticaceae	**Nettle Family**																
Urtica dioica	Stinging Nettle	SE2							X		X						
Vitaceae	**Grape Family**																
Parthenocissus quinquefolia	Virginia Creeper	S4?					X		X			X	X				X
Vitis riparia	Riverbank Grape	S5					C		X	X	X	X	X			X	X
Monocotyledons	**Monocots**																
Poaceae	**Grass Family**																
Dactylis glomerata	Orchard Grass	SE5					IC		X		X	X					
Echinochloa crus-galli	Large Barnyard Grass	SE5					IC		X				X				
Elymus virginicus	Virginia Wildrye	S5							X	X							
Phalaris arundinacea	Reed Canary Grass	S5					C		X						X		X
Phragmites australis	Common Reed	SU							X	X					X		
Typhaceae	**Cattail Family**																
Typha latifolia	Broad-leaved Cattail	S5					C		X						X		
TOTAL								**6**	**72**	**37**	**25**	**16**	**29**	**6**	**14**	**16**	**11**

*NHIC Atlas Square(s): 17MH8124

Elgin Region Status (Oldham 2017)

H	Historic	Native in all Carolinian Zone areas and no known records for at least 30 years in all areas where native and ranked (i.e. not X). Occasionally used for a native species known to be extirpated from its only known Carolinian Zone location(s).
R	Rare	Native to the Carolinian Zone and (a) rare (as defined in source lists; sometimes including "very uncommon") or historic (no records in ≥30 years) in more than half of the Carolinian Zone areas (≥6) in which it is native and ranked (i.e. not X); or (b) if rare or historic in <6 areas it must be uncommon or common in no more than one area.
U	Uncommon	Native in the Carolinian Zone and (a) listed as common in no more than one Carolinian Zone area; and (b) not rare or historic in more than half of the Carolinian Zone areas (≥6) in which it is native and ranked (i.e. not X).
C	Common	Native in the Carolinian Zone and (a) common in at least two Carolinian Zone areas; and (b) not rare or historic in more than half of the Carolinian Zone areas (≥6) in which it is native and ranked (i.e. not X).
X	No status	Present and native in the Carolinian Zone but no status assigned because of lack of information, often due to confusion with similar species.
I	Introduced	
N	Native	
hyb	Hybrid	

References

Ministry of Natural Resources and Forestry (MNRF). 2021. Natural Heritage Information Centre (NHIC): Species List for Ontario. Published: 2014-07-17. All Species List Updated: 2021-07-29. Available: https://www.ontario.ca/page/get-natural-heritage-information=Ministry of the Environment, Conservation, and Parks (MECP). 2022. Species at Risk in Ontario. Published: 2018-07-12. Updated: 2022-01-31. Available: https://www.ontario.ca/page/species-risk-ontario

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Oldham, M.J. 2017. List of the Vascular Plants of Ontario's Carolinian Zone (Ecoregion 7E). Carolinian Canada and Ontario Ministry of Natural Resources and Forestry. Peterborough, ON. 132 pp.

Ministry of Natural Resources and Forestry (MNRF). 2022. Natural Heritage Information Centre (NHIC): Make a Natural Heritage Area Map Application. Published: 2014-07-17. Updated 2022-01-20. Available: https://www.ontario.ca/page/make-natural-heritage-area-map

Odonate Species Reported from the Study Area - Kettle Creek GC, Port Stanley (Project #2982)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Odonate Atlas*	NHIC Data**
		MNRF 2022a	MECP 2022	Government of Canada 2022	Government of Canada 2022	Government of Canada 2022	OOAD 2022	MNRF 2022b
Calopterygidae	**Broadwinged Damselflies**							
Calopteryx maculata	Ebony Jewelwing	S5					X	
Hetaerina americana	American Rubyspot	S4					X	
Lestidae	**Spreadwings**							
Lestes dryas	Emerald Spreadwing	S5					X	
Lestes rectangularis	Slender Spreadwing	S5					X	
Coenagrionidae	**Narrow-winged Damselflies**							
Amphiagrion saucium	Eastern Red Damsel	S4					X	
Argia apicalis	Blue-fronted Dancer	S4					X	
Argia fumipennis violacea	Violet Dancer	S5					X	
Chromagrion conditum	Aurora Damsel	S5					X	
Enallagma antennatum	Rainbow Bluet	S4					X	
Enallagma basidens	Double-striped Bluet	S3					X	
Enallagma civile	Familiar Bluet	S5					X	
Enallagma ebrium	Marsh Bluet	S5					X	
Enallagma exsulans	Stream Bluet	S5					X	
Enallagma signatum	Orange Bluet	S4					X	
Ischnura posita	Fragile Forktail	S4					X	
Ischnura verticalis	Eastern Forktail	S5					X	
Nehalennia irene	Sedge Sprite	S5					X	
Aeshnidae	**Darners**							
Aeshna constricta	Lance-tipped Darner	S5					X	
Aeshna umbrosa	Shadow Darner	S5					X	
Anax junius	Common Green Darner	S5					X	
Epiaeschna heros	Swamp Darner	S3S4					X	
Corduliidae	**Emeralds**							
Epitheca princeps	Prince Baskettail	S5					X	
Libellulidae	**Skimmers**							
Leucorrhinia intacta	Dot-tailed Whiteface	S5					X	
Libellula pulchella	Twelve-spotted Skimmer	S5					X	
Libellula quadrimaculata	Four-spotted Skimmer	S5					X	
Pachydiplax longipennis	Blue Dasher	S5					X	
Perithemis tenera	Eastern Amberwing	S4					X	
Plathemis lydia	Common Whitetail	S5					X	
Sympetrum corruptum	Variegated Meadowhawk	S3					X	
Sympetrum semicinctum	Band-winged Meadowhawk	S4					X	
Tramea lacerata	Black Saddlebags	S4					X	
Total							**30**	**0**

**Odonate Atlas Square Numbers: 17MH82*
***NHIC Atlas Squares: 17MH8124*

References

Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF). 2022. Natural Heritage Information Centre (NHIC): Species List for Ontario. Published: 2014-07-17. All Species List Updated: 2022-04-11. Available: https://www.ontario.ca/page/get-natural-heritage-information

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Ontario Odonata Atlas Database. 2022. Natural Heritage Information Centre, Ontario Ministry of Natural Resources and Forestry. Species list from atlas square 17MH82 queried on Nov 14, 2022 by C.D. Jones.

Ministry of Natural Resources and Forestry (MNRF). 2022. Natural Heritage Information Centre (NHIC): Make a Natural Heritage Area Map Application. Published: 2014-07-17. Updated 2022-01-20. Available: https://www.ontario.ca/page/make-natural-heritage-area-map

Butterfly Species Reported from the Study Area - Kettle Creek GC, Port Stanley (Project #2982)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Ontario Butterfly Atlas*	NHIC Data**
		MNRF 2022a	MECP 2022	Government of Canada 2022	Government of Canada 2022	Government of Canada 2022	Macnaughton et al. 2022	MNRF 2022b
Hesperiidae	**Skippers**							
Epargyreus clarus	Silver-spotted Skipper	S4					X	
Erynnis baptisiae	Wild Indigo Duskywing	S4					X	
Euphyes conspicua	Black Dash	S3					X	
Euphyes vestris	Dun Skipper	S5					X	
Hylephila phyleus	Fiery Skipper	SNA					X	
Pholisora catullus	Common Sootywing	S4					X	
Poanes hobomok	Hobomok Skipper	S5					X	
Polites origenes	Crossline Skipper	S4					X	
Polites peckius	Peck's Skipper	S5					X	
Polites themistocles	Tawny-edged Skipper	S5					X	
Thorybes pylades	Northern Cloudywing	S5					X	
Wallengrenia egeremet	Northern Broken Dash	S5					X	
Papilionidae	**Swallowtails**							
Battus philenor	Pipevine Swallowtail	SNA					X	
Papilio cresphontes	Giant Swallowtail	S4					X	
Papilio glaucus	Eastern Tiger Swallowtail	S5					X	
Papilio polyxenes	Black Swallowtail	S5					X	
Papilio troilus	Spicebush Swallowtail	S4					X	
Pieridae	**Whites and Sulphurs**							
Colias eurytheme	Orange Sulphur	S5					X	
Colias philodice	Clouded Sulphur	S5					X	
Pieris rapae	Cabbage White	SNA					X	
Pontia protodice	Checkered White	SNA					X	
Pyrisitia lisa	Little Yellow	SNA					X	
Lycaenidae	**Harvesters, Coppers, Hairstreaks, Blues**							
Celastrina sp.	Azure species	SNA					X	
Cupido comyntas	Eastern Tailed Blue	S5					X	
Satyrium acadica	Acadian Hairstreak	S4					X	
Satyrium calanus	Banded Hairstreak	S4					X	
Satyrium favonius ontario	Northern Oak Hairstreak	S1		T	NS	No schedule	X	X
Satyrium titus	Coral Hairstreak	S5					X	
Strymon melinus	Gray Hairstreak	S4					X	
Nymphalidae	**Brush-footed Butterflies**							
Cercyonis pegala	Common Wood-Nymph	S5					X	
Coenonympha california	Common Ringlet	S5					X	
Danaus plexippus	Monarch	S2N,S4B	SC	E	SC	Schedule 1	X	
Euptoieta claudia	Variegated Fritillary	SNA					X	
Junonia coenia	Common Buckeye	SNA					X	
Lethe anthedon	Northern Pearly-Eye	S5					X	
Lethe appalachia	Appalachian Brown	S4					X	
Libytheana carinenta	American Snout	SNA					X	
Limenitis archippus	Viceroy	S5					X	
Limenitis arthemis astyanax	Red-spotted Purple	S5					X	
Megisto cymela	Little Wood-Satyr	S5					X	
Nymphalis antiopa	Mourning Cloak	S5					X	

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Ontario Butterfly Atlas*	NHIC Data**
		MNRF 2022a	MECP 2022	Government of Canada 2022	Government of Canada 2022	Government of Canada 2022	Macnaughton et al. 2022	MNRF 2022b
Phyciodes cocyta	Northern Crescent	S5					X	
Polygonia comma	Eastern Comma	S5					X	
Polygonia interrogationis	Question Mark	S5					X	
Speyeria cybele	Great Spangled Fritillary	S5					X	
Vanessa atalanta	Red Admiral	S5B					X	
Vanessa cardui	Painted Lady	S5B					X	
Vanessa virginiensis	American Lady	S5					X	
							48	**1**

**NHIC Atlas Square: 17MH8124

References

Ministry of Natural Resources and Forestry (MNRF). 2022a. Natural Heritage Information Centre (NHIC): Species List for Ontario. Published: 2014-07-17. All Species List Updated: 2022-04-11. Available: https://www.ontario.ca/page/get-natural-heritage-information

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Government of Canada. 2022. Species at Risk Public Registry: Species Search. COSEWIC Last Assessment Date: 2022-05-11. Available: https://species-registry.canada.ca/index-en.html#/species?sortBy=commonNameSort&sortDirection=asc&pageSize=10

Macnaughton A., Layberry R., Cavasin R., Edwards B., and C. Jones. 2022. Ontario Butterfly Atlas. Updated February 2022. Available: https://www.ontarioinsects.org/atlas/index.html

Ministry of Natural Resources and Forestry (MNRF). 2022b. Natural Heritage Information Centre (NHIC): Make a Natural Heritage Area Map Application. Published: 2014-07-17. Updated 2022-01-20. Available: https://www.ontario.ca/page/make-natural-heritage-area-map

Appendix V
Preliminary Concept Plan

LAND USE SCHEDULE

LAND USE	AREA in Ha	PERCENT
SINGLE DETACHED LOTS	8.98	68.0
TOWNHOUSE BLOCKS	0.62	4.7
COMMON ELEMENT ROADS	3.60	27.3
DRAFT PLAN OF VACANT LAND CONDOMINIUM AREA	13.20	100.0
NATURAL ENVIRONMENT	6.30	
SWM POND - MUNICIPAL	1.50	
GOLF COURSE	9.00	
TOTAL SITE AREA	30.00	Ha
DENSITY (164)	12.4	U/ Ha

POTENTIAL UNITS

- 15.24m LOT (50') & 12.8m (42') WIDE DWELLING [77 UNITS]
- 14.4m LOT (47.2') & 12m (40') WIDE DWELLING (38 UNITS)
- 13.7m LOT (45') & 11.3m (37') WIDE DWELLING (36 UNITS)
- 11.3m (37') WIDE TOWNHOMES (13 UNITS)

AGRICULTURAL

WOODLAND

SUBJECT LANDS
± 30 Ha (74.1 Acres)

LOW DENSITY RESIDENTIAL

NATURAL HERITAGE

NATURAL HAZARD LIMITS
(OFFICIAL PLAN SCHEDULE G, LAND USE)

NATURAL ENVIRONMENT 6.3 Ha

LOCATION OF EX. CART PATH

KETTLE CREEK FLOODFRINGE
(OFFICIAL PLAN SCHEDULE G2, NATURAL HAZARDS)

POTENTIAL PARTIAL POND FILLED

86 LOT SUBDIVISION

POTENTIAL SINGLE DETACHED DWELLINGS

SHARED AMENITY SPACE 1.6 Ha

EX. BRIDGE

EX. POND

PROPOSED SWM POND LOCATION FOR 86 LOT SUBDIVISION

BREAKWATER BOULEVARD

THE PROMENADE

SANDCASTLE KEY

PUBLIC PARK

FUTURE 4 STOREY APARTMENT

EX. DRAIN

FUTURE 6 STOREY APARTMENT

FUTURE 6 STOREY APARTMENT

SWM POND

POTENTIAL 9 HOLE PITCH AND PUTT (ALIGNMENT TO BE DETERMINED) 9 Ha

POTENTIAL TOWNHOMES

SWM POND 1.5 Ha

KETTLE CREEK FLOODFRINGE

MARR DRAIN (OPEN CHANNEL)

LAKE LINE

SOCCER FIELDS

KETTLE CREEK GOLF & COUNTRY CLUB

EX. PARKING

EX. MAINTENANCE SHED

POTENTIAL SECONDARY ACCESS

COMMUNITY CENTER AND ARENA

PUBLIC SCHOOL

CARLOW ROAD

WARREN ST

KETTLE CREEK

PRELIMINARY

FOR DISCUSSION PURPOSES ONLY

ALL LIMITS ARE APPROXIMATE

Jun 17, 2022

Monteith+Brown planning consultants

Draft Plan of Vacant Land Condominium - Concept B

KETTLE CREEK GOLF COURSE

JAMES GLOVER

22-1800

1: 3,000 (11x17)

NORTH

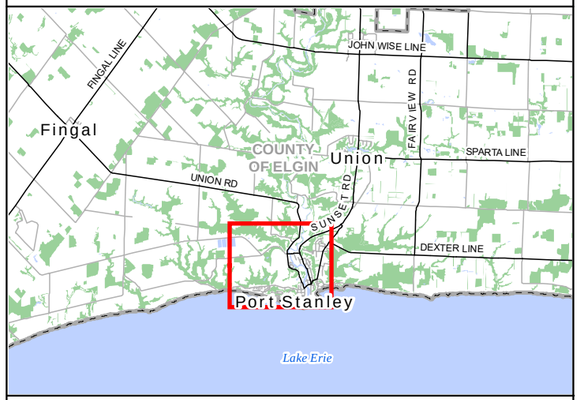
0 30 60 90m

MAPS

Map 1

Kettle Creek Golf Course

Study Area and Natural Features



Legend

- Study Area
- Subject Property
- 1km Buffer
- Railway
- Primary Road
- Secondary Road
- Permanent Watercourse
- Intermittent Watercourse
- Water Body
- Other Wetland (Non-PSW)
- Wooded Area
- ANSI, Earth Science

Aquatic Resource Areas (ARA)

- ARA Survey Point
- ARA Line Segment
- ARA Polygon

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2982
Date: December 22, 2022

NAD83 - UTM Zone 17
Size: 11x17"
1:11,000

0 200 400 600 Metres

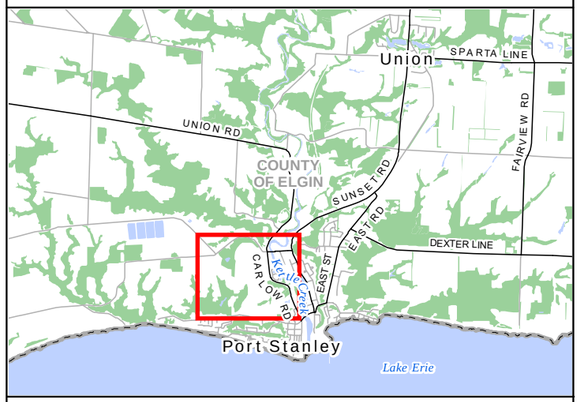
N

Path: X:\2982_KettleCreekGC_PortStanley\NRSI_2982_Map1_StudyAreaNaturalFeatures_11K_2022_12_22_KEF.mxd

Map 2

Kettle Creek Golf Course

Vegetation Communities



481000 481500 482000

4725000 4724500 4724000

LAKE LINE
SCOTCH LINE
UNION ROAD
SUNSET ROAD
WARREN STREET
CATHERINE STREET
COLBORNE STREET
ELIZABETH STREET
CARLOW ROAD
GEORGE STREET
WILLIAM STREET

CUW1 CUT1 Ag Res H FOD7 CUT1 SAS1 Res FOD5-2 SWT2-2 H CUP3-2 Res Arena Res OA H Ag CUT1-5 FOD5-2 CUP3-2 Golf Course Golf Course CUP3-2 CUM1-1 FOD5 FOD5-2 CUW CUW2 CUP3-2 CUT SA Res FOD5-2 FOD7 Res CUT Res CUW Res Res

Legend

- Subject Property
- Railway
- Primary Road
- Secondary Road
- Permanent Watercourse
- Intermittent Watercourse
- Ecological Land Classification (ELC)
- (Ag) Agriculture
- (CUM1-1) Dry - Moist Old Field Meadow Type
- (CUP3-2) White Pine Coniferous Plantation Type
- (CUT) Cultural Thicket
- (CUT1) Mineral Cultural Thicket Ecosite
- (CUT1-5) Raspberry Cultural Thicket Type
- (CUW) Cultural Woodland
- (CUW1) Mineral Cultural Woodland Ecosite
- (CUW2) Bedrock Cultural Woodland Ecosite
- (FOD5) Dry - Fresh Sugar Maple Deciduous Forest Ecosite
- (FOD5-2) Dry - Fresh Sugar Maple - Beech Deciduous Forest Type
- (FOD7) Fresh - Moist Lowland Deciduous Forest Ecosite
- (H) Hedgerow
- (OA) Open Water
- (Res) Residential
- (SA) Shallow Water
- (SAS1) Submerged Shallow Aquatic Ecosite
- (SWT2-2) Willow Mineral Thicket Swamp Type

Natural Resource Solutions Inc.
Aquatic, Terrestrial and Wetland Biologists

Project: 2982
Date: November 25, 2022

NAD83 - UTM Zone 17
Size: 11x17"
1:5,500

N

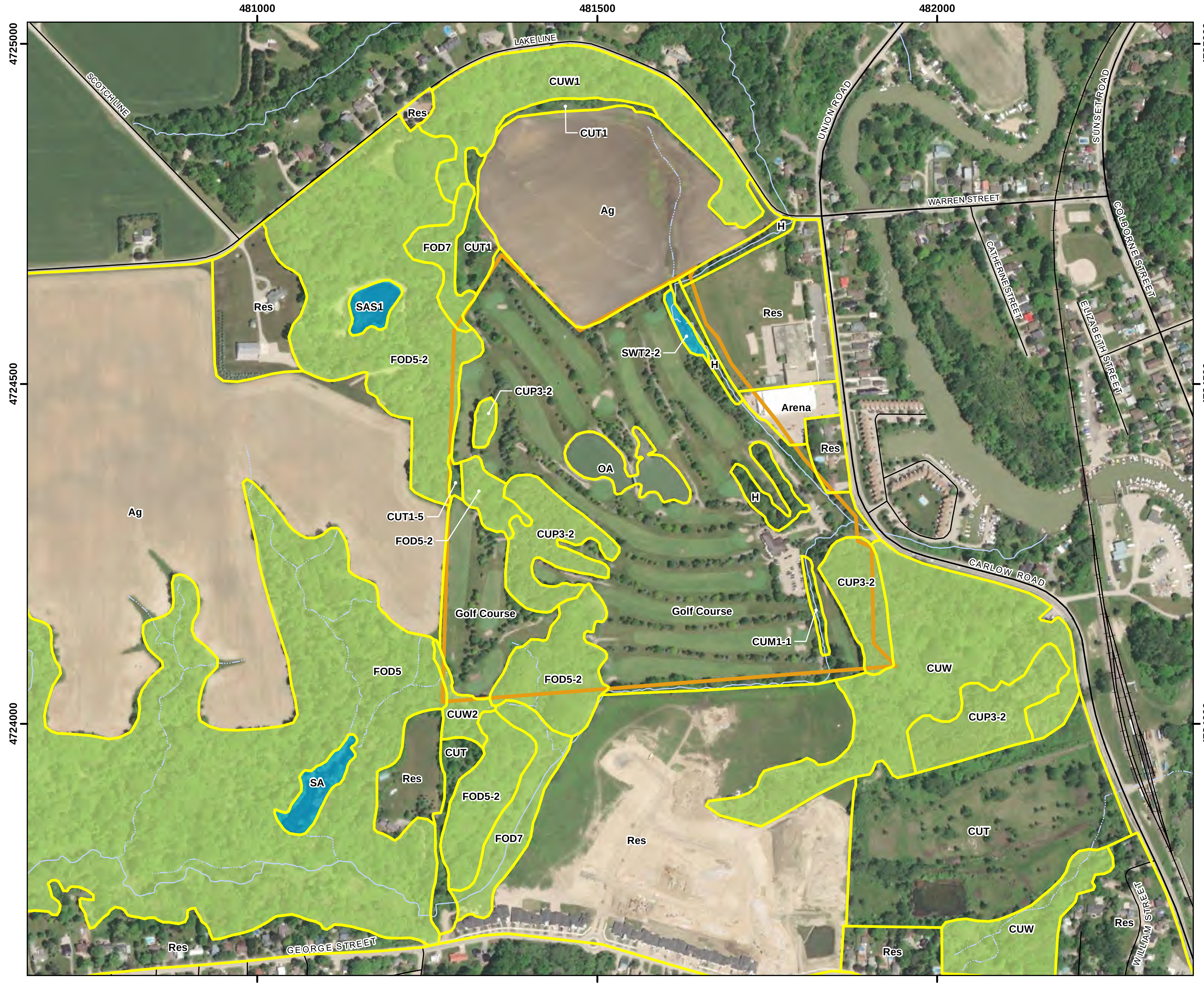
0 50 100 150 200 250 300 350 Metres

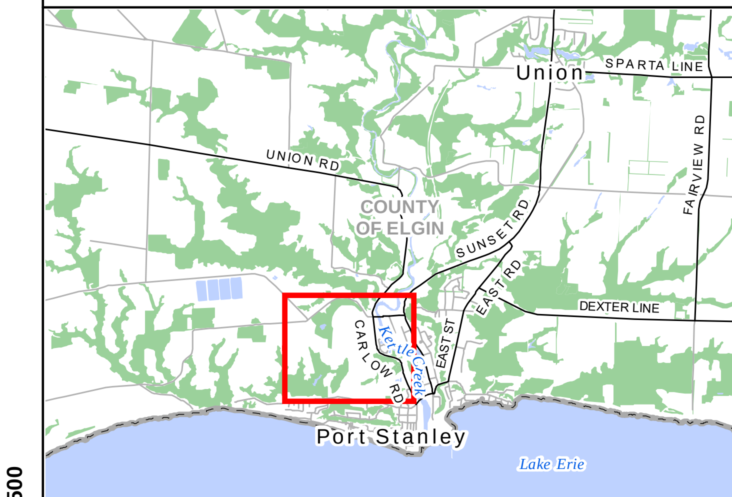
Path: X:\2982_KettleCreekGC_PortStanley\NRSI_2982_Map2_ELC_6K_2022_11_25_GCS.mxd

Map 3

Kettle Creek Golf Course

Sensitive and Significant Features





Legend

- Subject Property
- Railway
- Primary Road
- Secondary Road
- Permanent Watercourse
- Intermittent Watercourse
- Wetlands
- Preliminary Significant Woodlands (Central Elgin OP, County of Elgin OP)
- Ecological Land Classification (ELC)
- (Ag) Agriculture
- (CUM1-1) Dry - Moist Old Field Meadow Type
- (CUP3-2) White Pine Coniferous Plantation Type
- (CUT) Cultural Thicket
- (CUT1) Mineral Cultural Thicket Ecosite
- (CUT1-5) Raspberry Cultural Thicket Type
- (CUW) Cultural Woodland
- (CUW1) Mineral Cultural Woodland Ecosite
- (CUW2) Bedrock Cultural Woodland Ecosite
- (FOD5) Dry - Fresh Sugar Maple Deciduous Forest Ecosite
- (FOD5-2) Dry - Fresh Sugar Maple - Beech Deciduous Forest Type
- (FOD7) Fresh - Moist Lowland Deciduous Forest Ecosite
- (H) Hedgerow
- (OA) Open Water
- (Res) Residential
- (SA) Shallow Water
- (SAS1) Submerged Shallow Aquatic Ecosite
- (SWT2-2) Willow Mineral Thicket Swamp Type

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2982
Date: December 22, 2022

NAD83 - UTM Zone 17
Size: 11x17"
1:5,500

0 50 100 150 200 250 300 350 Metres

N

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Appendix III
Species at Risk (SAR) and Species of Conservation Concern (SCC) Screening Table

Scientific Name	Common Name	S-RANK[1]	SARO[1]	COSEWIC[2]	SARA[2]	SARA Schedule[2]	Background Source	Observed by NRSI	Habitat Requirements	Suitable Habitats within Subject Property	Rationale
Birds											
Ammodramus savannarum	Grasshopper Sparrow	S4B	SC	SC	SC	Schedule 1		No	Well-drained grassland or prairie with low cover of grasses, taller weeds or sandy soil; hayfields or weedy fallow fields; uplands with ground vegetation of various densities. Requires perches for singing and tracts of grassland generally >5ha.[3,4]	No	There are no grasslands, prairie, hayfields or fallow fields present within the subject property.
Antrostomus vociferus	Eastern Whip-poor-will	S4B	THR	T	T	Schedule 1		No	Areas with a mix of open and forested areas, such as open woodlands, savannas, pine plantations, woodland edges, or openings in more mature deciduous, coniferous and mixed forests. Forages in open areas and uses forested areas for roosting and nesting.[3,4]	Yes	The combination of open golf course and woodland within the subject property could provide candidate foraging and roosting/ nesting habitat.
Asio flammeus	Short-eared Owl	S4?B, S2S3N	SC	T	SC	Schedule 1		No	Grasslands, open areas or meadows that are grassy or bushy; marshes, bogs or tundra. Nests on the ground and requires 75-100 ha of contiguous open habitat.[3,4]	No	The open habitat within the subject property is not large enough to support candidate habitat for this species.
Baeolophus bicolor	Tufted Titmouse	S3					BSC et al. 2006; MNRF 2023	Yes	Deciduous woods or mixed evergreen-deciduous wood, typically in areas with a dense canopy and many tree species. They are also common in orchards, parks, and suburban areas. [26]	Yes	The deciduous woodlands within the subject property may provide suitable habitat. A Tufted Titmouse was incidentally observed within the subject property, however no breeding evidence was reported.
Cardellina canadensis	Canada Warbler	S5B	SC	SC	T	Schedule 1		No	Moist, mixed coniferous and deciduous forests with well-developed, dense shrub layer and closed canopy; wet bottomlands of cedar or alder; shrubby undergrowth in cool moist mature woodlands; riparian habitat. Most often found in large forest tracks.[3,4]	Yes	There is suitable habitat present within the subject property, however the subject property is not within the core breeding area for Canada Warbler and therefore likely only provides suitable migration stopover habitat.
Centronyx henslowii	Henslow's Sparrow	S1B	END	E	E	Schedule 1		No	Large, fallow, grassy area with ground mat of dead vegetation, dense herbaceous vegetation, ground litter and some song perches; neglected weedy fields; wet meadows; cultivated uplands. Requires a minimum tract of grassland of 40 ha, but usually in areas >100 ha.[3,4]	No	There is no suitable habitat present within the subject property.
Chaetura pelagica	Chimney Swift	S3B	THR	T	T	Schedule 1	BSC et al. 2006	No	Commonly found in urban areas near buildings; nests in chimneys, hollow trees,and crevices of rock cliffs. Feeds over open water.[3,4]	No	The subject property lacks chimneys, rock cliffs, and other suitable nesting structures required to support this species.
Charadrius melodus	Piping Plover	S1B	END	E	E	Schedule 1		No	Dry, sandy outer beaches; upper stretches near dunes, usually large open, grassless areas, but sometimes with sparse scattering of beach grass.[3,4]	No	There are no grassless areas within the subject property.
Chlidonias niger	Black Tern	S3B, S4M	SC	NAR	NAR			No	Large cattail marshes; marshy edges of rivers, lakes or ponds; wet open fens; wet meadows. Returns to same area to nest each year. Must have areas of shallow water (0.5 to 1m deep) and area of open water near nests. Generally found in marshes >20 ha in size.[3,34]	No	There were no marshes >20ha present within the subject property. No Black Terns were reported during field investigations.
Chordeiles minor	Common Nighthawk	S4B	SC	SC	T	Schedule 1		No	Open ground; clearings in dense forests (including burns and logged areas); rock barrens; peat bogs; ploughed fields; gravel beaches or barren areas with rocky soils; open woodlands; flat gravel roofs.[3,4]	No	There is no suitable habitat present within the subject property.
Coccothraustes vespertinus	Evening Grosbeak	S4	SC	SC	SC	Schedule 1		No	Open, mature mixed-wood forests dominated by fir species, White Spruce and/or Trembing Aspen.[3,4]	No	There are no mixed forest communities within the subject property.
Colinus virginianus	Northern Bobwhite	S1?	END	E	E	Schedule 1	BSC et al. 2006, MNRF 2023	No	Grassland, prairie or hay fields with woody cover in form of thickets, tangles of vines, shrubs; fence rows or woodland edges; cropland growing corn, soybeans or small grains and clover or grass; well-drained sandy or loamy soil; pond edges.[3,4]	No	Grassland, prairie, hay fields and cropland are absent from the subject property. The species may utilize agriculture fields found in the study area.
Contopus virens	Eastern Wood-pewee	S4B	SC	SC	SC	Schedule 1	BSC et al. 2006; MNRF 2023	Yes	Mid-canopy layer of forest clearings and edges of deciduous and mixed forest. Abundant in intermediate-age mature forest stands with little understory vegetation.[3,4]	Yes	This species may utilize treed features within the subject property and study area. Eastern Wood-pewee was observed at several locations throughout the subject property and study area.

Scientific Name	Common Name	S-RANK[1]	SARO[1]	COSEWIC[2]	SARA[2]	SARA Schedule[2]	Background Source	Observed by NRSI	Habitat Requirements	Suitable Habitats within Subject Property	Rationale
Dolichonyx oryzivorus	Bobolink	S4B	THR	SC	T	Schedule 1	BSC et al. 2006	No	Large (>10 ha), open expansive grasslands, pastures, hayfields, meadows or fallow fields with dense ground cover. Occassionally nest in large (>50 ha) fields of winter wheat and rye in southwestern Ontario. [3,4]	No	Grasslands and fields of sufficient size are not present within the subject property. This species may utilize agricultural fields within the study area.
Empidonax virescens	Acadian Flycatcher	S1B	END	E	E	Schedule 1	BSC et al. 2006	No	Mature, shady, deciduous and mixed forests; heavily wooded ravines; creek bottoms or river swamps. Generally needs at least 30 ha of forest.[3,4]	No	Mature forest communities of sufficient size are not present within the subject property. This species may utilize woodlands in the study area.
Gallinula galeata	Common Gallinule	S3B					MNRF 2023	No	Freshwater and brackish marshes, ponds, and lakes that have a mix of submerged, floating, and emergent aquatic vegetation and are open water year-round. They also use artificial aquaculture ponds, rice fields, sewage lagoons, and urban stormwater retention ponds.	No	A mix of suitable vegetation is not present in the documented wetlands and ponds.
Haliaeetus leucocephalus	Bald Eagle	S4	SC	NAR	NS	No Schedule	MNRF 2023	No	A variety of mature forest types adjacent to large lakes or rivers. Generally nest in tall supercanopy trees, a short distance from shore.[3,4]	Yes	The subject property contains mature forest adjacent to Kettle Creek and a short distance from Lake Erie. There is also mature forest habitat within the study area that is close to Lake Erie.
Hirundo rustica	Barn Swallow	S4B	SC	SC	T	Schedule 1	BSC et al. 2006, MNRF 2023	Yes	Farmlands, rural areas and other open or semi-open areas near body of water. Nests almost exclusively on human-made structures such as open barns, buildings, bridges and culverts.[3,4]	Yes	The subject property contains semi-open areas and human-made structures, and is adjacent to open agricultural habitats. Barn Swallows were observed at several locations throughout the subject property, but no nests were observed.
Hylocichla mustelina	Wood Thrush	S4B	SC	T	T	Schedule 1	BSC et al. 2006, MNRF 2023	Yes	Carolinian and Great Lakes-St. Lawrence forest zones. Undisturbed moist mature deciduous or mixed forest with deciduous sapling growth. Near pond or swamp. Must have some trees higher than 12 m.[3,4]	Yes	Suitable forest habitat with wetland features are present in the study area and subject property. Wood Thrush was observed within a forest habitat adjacent to the subject property.
Melanerpes erythrocephalus	Red-headed Woodpecker	S3	END	E	E	Schedule 1	BSC et al. 2006; MNRF 2023	Yes	Open, deciduous forest with little understory; fields, parks or pasture lands with scattered large trees; wooded swamps; orchards, small woodlots or forest edges; groves of dead or dying trees. Requires cavity trees with at least 40 cm dbh.[3,4]	Yes	Forest and forest edge habitat are present within the subject property. A Red-headed Woodpecker was observed south of the subject property, within the broader study area. Two cavity trees with greater than 40 cm dbh were observed within the subject property during bat habitat assessment surveys, although more may exist.
Parkesia motacilla	Louisiana Waterthrush	S2B	THR	T	T	Schedule 1	BSC et al. 2006	No	Usually steep, forested ravines with fast-flowing streams. Prefers running water, especially clear, coldwater streams, but also less frequently inhabits heavily wooded, deciduous swamps having large pools of open water.[3,4]	No	Steep, forested ravines, fast-flowing streams and swamps are not present within the subject property.
Progne subis	Purple Martin	S3B					BSC et al. 2006	Yes	Purple Martins forage over towns, cities, parks, open fields, dunes, streams, wet meadows, beaver ponds, and other open areas. In eastern North America they used to breed along forest edges and rivers, where dead snags offered woodpecker holes to nest in. But since humans began supplying nest boxes for them, eastern martins have become urbanites, living almost exclusively near cities and towns. [27]	Yes	Open areas, forest edges, and a watercourse exist within the subject property. These features, as well as a river, exist within the study area. Tree cavities that may offer nesting habitat are present within the subject property. The subject property is adjacent to a town. A Purple Martin was observed during breeding bird surveys. As this species nests almost exclusively in towns and cities, suitable habitat will be enhanced through the proposed development.
Riparia riparia	Bank Swallow	S4B	THR	T	T	Schedule 1	BSC et al. 2006	Yes	Nests in burrows in natural and human-made settings with vertical faces in silt and sand deposits. Usually on banks of river and lakes, but also found in sand and gravel pits.[3,4]	No	River banks, sand, and gravel vertical faces are not present within the subject property. Several Bank Swallows were observed foraging in the agricultural area to the north of the subject property, within the study area.

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Sturnella magna	Eastern Meadowlark	S4B, S3N	THR	T	T	Schedule 1	BSC et al. 2006, MNRF 2023	No	Open pastures, hayfields, grasslands or grassy meadows with elevated singing perches (small trees, shrubs or fence posts). Also weedy borders of croplands, roadsides, orchards, airports, shrubby overgrown fields or other open areas. Generally prefers larger tracts of habitat >10 ha, but will sometimes use smaller tracts.[3,4]	No	Meadows of suitable size, with suitable graminoid cover, are not present.
Herpetofauna											
Turtles											
Apalone spinifera	Eastern Spiny Softshell	S2	END	E	E	Schedule 1	MNRF 2023	No	Large rivers and lakes, as well as seasonally in streams, creeks, marshes, ponds, and oxbows, especially those near large rivers or lakes. Key habitat requirements: open areas for basking with basking structures, open sand or gravel nesting areas, shallow muddy or sandy substrates to bury in, deep pools for hibernation. These habitats may be spread over a large area as long as the turtles can travel between them.[5]	No	Large rivers and lakes are not present within the subject property. The pond on the property are not likely to provide sufficient habitat for this species. The river within the study area may provide suitable habitat.
Chelydra serpentina	Snapping Turtle	S4	SC	SC	SC	Schedule 1	MNRF 2023; Ontario Nature 2019	Yes	Slow-flowing rivers and streams, lakes, and permanent or semi-permanent wetlands with soft substrates and vegetation. Key habitat requirements: open areas with structures for basking, open sand or gravel areas for nesting, shallow areas with soft substrates to bury in, soft banks or substrates for hibernation.[3]	Yes	Three young Snapping Turtles were observed basking in the northeast wetlands within the spring timing window.
Chrysemys picta marginata	Midland Painted Turtle	S4		SC	SC	Schedule 1	MNRF 2023; Ontario Nature 2019	No	Midland Painted Turtles are found in shallow aquatic habitats with slow-moving water, soft bottoms, aquatic vegetation.	Yes	The golf course ponds and watercourses may provide suitable habitat within the subject property. Lakes and other slow-moving water bodies within the study area may also provide suitable habitat. None were observed during the field program.
Snakes											
Sistrurus catenatus pop. 2	Massasauga (Carolinian population)	S1	END	E	E	Schedule 1	Ontario Nature 2019	No	Semi-open or open habitats such as meadows, clearings, tall grass prairie, as well as bogs, marshes, forests, and forest edges. Require open areas to warm themselves in the sun. Foraging occurs in lowland habitats such as grasslands, wetlands, and bogs. Hibernate underground in mammal or crayfish burrows, root systems in shrub or forest communities.[6]	No	Tall grass prairies, meadows, bogs and marshes are not present within the subject property. This species was last reported from this area in 1930 and is no longer likely to be present within the subject property.
Thamnophis sauritus septentrionalis	Northern Ribbonsnake	S4	SC	SC	SC	Schedule 1	MNRF 2023, Ontario Nature 2019	No	Sunny grassy areas with low dense vegetation near bodies of shallow permanent quiet water; wet meadows, marshes, borders of ponds, lakes or streams.[3]	No	The pond and watercourse within the subject property lacks the low dense vegetation required to support this species.
Mammals											
Microtus pinetorum	Woodland Vole	S3?	SC	SC	SC	Schedule 1	Dobbyn 1994	No	Mature deciduous forest in the Carolinian region where there is a deep litter layer that allows it to burrow.[3,4]	No	The particular Carolinian forest type used by Woodland Vole is not present on the subject property.
Myotis leibii	Eastern Small-footed Myotis	S2S3	END				Dobbyn 1994	No	Roosts in caves, mine shafts, crevices or buildings that are in or near woodland. Hibernates in cold dry caves or mines. Maternity colonies in caves or buildings. Hunts in forests.[3,4]	No	The forest communities within the subject property and study area may support this species.

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Myotis septentrionalis	Northern Myotis	S3	END	E	E	Schedule 1	Dobbyn 1994	No	Roosts in houses and man-made structures but prefers hollow trees or under loose bark. Hibernates in mines or caves. Hunts within forest, below the canopy.[3,4]	Possible	The forest communities within the subject property and study area may support this species.
Taxidea taxus jacksoni	American Badger (Southwestern Ontario population)	S1	END	E	E	Schedule 1	Dobbyn 1994	No	Open grasslands, oak savannahs, sand barrens and farmland.[3,4]	No	Suitable grasslands and natural open areas are not present.
Butterflies											
Danaus plexippus	Monarch	S2N, S4B	SC	END	SC	Schedule 1	Macnaughton et al. 2023	Yes	Adults found in a diversity of habitats with a variety of wildflowers. Caterpillars are confined to meadows and open areas where milkweeds grow (larval food plants).[3]	Yes	Milkweed (*Ascelpias* sp.) are present within the subject property within a small section of cultural meadow. Monarchs were observed within the subject property.
Euphyes conspicua	Black Dash	S3					Macnaughton et al. 2023	No	Marshes, wet grassland and sedge meadows, and wet areas along roadsides and streams. [28]	No	The limited marsh habitat within the subject property is too dense and does not provide adequate nectaring habitat.
Satyrium favonius ontario	Northern Oak Hairstreak	S1		T	NS	No Schedule	MNRF 2023	No	Oak woodlands with > 60% canopy cover. Adults are nectar generalists and visit floral resources within forest openings or meadows adjacent to the oak forest edges. Larval food plant(s) are unconfirmed in Canada, although suspected to be White Oak (Quercus alba). [29]	No	There are no oak woodlands within the subject property, or contiguous natural areas within the study area that have been surveyed.
Odonates											
Enallagma basidens	Double-striped Bluet	S3					OOAD 2022	No	Permanent and semipermanent ponds, lakes, reservoirs, and slow portions of streams and rivers. [30]	No	The limited marsh habitat within the subject property is too dense and does not provide adequate open foraging habitat.
Sympetrum corruptum	Variegated Meadowhawk	S3					OOAD 2022	No	Marshy lakes and ponds, often saline and sand-bottomed, slow streams, vegetated pools of rivers, and springs, as well as temporary pools and rain puddles. [31]	No	There is a pond and a watercourse within the subject property that may provide suitable habitat, but no individuals were observed.
Fish											
Macrhybopsis storeriana	Silver Chub	S2	THR	E	E	Schedule 1	MNRF 2023	No	Prefers medium to large rivers with substantial current and silt, sand or gravel bottoms, but in Ontario it is only found in the Great Lakes. Usually found in depths between seven and 12 metres, and is believed to spawn in May and June in open water areas.[3]	No	The subject property or study area does not encompass a Great Lake.
Plants											
Enemion biternatum	False Rue-anemone	S2	THR	T	T	Schedule 1	MNRF 2023	No	Rich deciduous forests, often on shaded banks of streams. Flowering in spring.[23,24]	Possible	There are deciduous forests, including sections that occur around a watercourse, within the subject property and study area that may provide suitable habitat.
Gentianella quinquefolia	Stiff Gentian	S2					MNRF 2023; Oldham 2017	No	Stream and river banks, marshy meadows; bluffs and forested hillsides; usually in ± calcareous sites. [23]	Possible	There is a watercourse that runs through the subject property in several areas that may provide suitable habitat.
Gleditsia triacanthos	Honey-locust	S2?					Oldham 2017	Yes	Indigenous on river banks and floodplains as far north as the Detroit, Huron, Kalamazoo, Maumee, Raisin, and St. Joseph River systems, as well as the shores of Lake Erie. [23]	Possible	The subject property is close to the shore of Lake Erie, however, Honey-locust is often planted as an ornamental throughout Ontario.
Juglans cinerea	Butternut	S2?	END	E	E	Schedule 1	MNRF 2023; Oldham 2017	No	Stream banks and swamps, as well as upland beech-maple, oak-hickory, and mixed hardwood stands.[7]	Possible	Upland forest communities are present within the subject property. This species is also reported from the area directly south of the subject property.
Juncus acuminatus	Sharp-fruited Rush	S3					MNRF 2023	No	Shores, swamps, ditches, springs, wet meadows, and rock outcrops. [24]	Possible	There is a swamp and seeps within the subject property. There may be additional swamps, ditches, springs, and wet meadows within the study area.

Scientific Name	Common Name	S-RANK[1]	SARO[1]	COSEWIC[2]	SARA[2]	SARA Schedule[2]	Background Source	Observed by NRSI	Habitat Requirements	Suitable Habitats within Subject Property	Rationale
Opuntia humifusa	Eastern Prickly Pear Cactus	S1	END	E	E	Schedule 1	MNRF 2023	No	Sandy fields and plains, open oak forests, stabilized open dunes and sometimes in disturbed ground along roadsides.[23]	No	Sandy fields and plains, open oak forests, stabilized open dunes are not present within the subject property. This species is not likely to be present.
Panax quinquefolius	American Ginseng	S2	END	E	E	Schedule 1	MNRF 2023; Oldham 2017	No	Rich, even swamy, hardwoods (beech, sugar maple, hemlock), especially on slopes or ravines (including forested dunes). Flowering in early summer.[7]	Possible	Forest communities within the subject property may support this species.
Phegopteris hexagonoptera	Broad Beech Fern	S3	SC	SC	SC	Schedule 3	MNRF 2023; Oldham 2017	No	Rich, moist decisuous forests, often at bases of slopes, edges of seeps, and along streams.[7]	Possible	Forest communities within the subject property may support this species.
Polygonum erectum	Erect Knotweed	SH					MNRF 2023; Oldham 2017	No	Dry, waste ground. [24]	Possible	There are disturbed areas within the subject property that may provide suitable habitat.
Ptelea trifoliata ssp. trifoliata	Common Hop-tree	S3	SC	SC	SC	Schedule 1	MNRF 2023	No	Forested to open dunes, sandy fields and knolls, fencerows and dry bluffs or banks. Rarely in moister sites along rivers and edges of floodplain forests.[23]	Possible	Dunes, sandy fields, knolls, fencerows, and dry bluffs or banks are not present within the subject property. Suitable habitat may be present in moister sites along watercourses within the subject property and study area.
Vicia caroliniana	Carolina Vetch	S2?					MNRF 2023; Oldham 2017	No	Oak and oak-hickory forests, borders of forests, dry open ground and clearings; less often in moist places, banks of streams and lakes. [23]	Possible	There are no oak-dominated forests in the subject property. There are borders of forests, open ground, and banks of watercourses within the subject property and study area that may provide suitable habitat.
Vulpia octoflora	Eight-flowered Fescue	S1S2					MNRF 2023; Oldham 2017	No	Usually in sandy, often disturbed places: dunes and shores, roadsides, oak forests, typically in bare soil. [23]	Possible	Disturbed areas within the golf course and roadsides may provide suitable habitat within the subject property. Suitable habitat may also exist in disturbed areas and roadsides within the study area.

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Scientific Name	Common Name	S-RANK[1]	SARO[1]	COSEWIC[2]	SARA[2]	SARA Schedule[2]	Background Source	Observed by NRSI	Habitat Requirements	Suitable Habitats within Subject Property	Rationale

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Appendix IV
Significant Wildlife Habitat (SWH) Screening Table

Significant Wildlife Habitat Type	Presence Within Study Area	Presence Within Subject Property	Assessment Details
Seasonal Concentration Areas			
Waterfowl Stopover and Staging Areas (Terrestrial)	Possible	Not Present	Agricultural fields found in the study area may flood with sheet water but would be unaffected by the proposed development. Sheet water flooding does not occur within the subject property.
Waterfowl Stopover and Staging Areas (Aquatic)	Not Present	Not Present	Water bodies within the subject property and study area are limited to constructed ponds within the golf course, which do not qualify as SWH.
Shorebird Migratory Stopover Area	Not Present	Not Present	Shoreline habitat is not present within the subject property or study area.
Raptor Wintering Area	Possible	Not Present	The study area contains large woodlands adjacent to agricultural fields that may provide suitable wintering raptor habitat. No suitable stick nests were observed during the field program.
Bat Hibernacula	Not Present	Not Present	The subject property and study area are not expected to contain caves, mine shafts, underground foundations, or karsts.
Bat Maternity Colonies	Candidate	Candidate	Trees in woodlands within subject property and study area may have suitable, large wildlife trees to support bat maternity colonies. Several bat habitat trees were observed during bat habitat assessment within the subject property.
Turtle Wintering Area	Possible	Candidate	The MAS2 and SWD communities within the subject property has been treated as confirmed wintering habitat for Snapping Turtle based on the observation of three young basking individuals during the spring timing window. The constructed ponds on the subject property is not likely to provide wintering habitat as turtles were not observed during any of the turtle basking surveys. The portion of Kettle Creek that falls within the the study area may also provide suitable habitat.
Reptile Hibernaculum	Candidate	Candidate	Snake hibernacula may occur throughout the protected naturalized portions of the subject property and study area.
Colonially - Nesting Bird Breeding Habitat (Bank and Cliff)	Possible	Not Present	The subject property does not contain exposed banks suitable for swallow nesting. Exposed soil may be found on the banks of Kettle Creek within the study area.
Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs)	Not Present	Not Present	Wetlands with standing dead trees are not present in the subject property or study area. Suitable species with confirmed breeding evidence were not observed during breeding bird surveys or incidentally through the field program.
Colonially - Nesting Bird Breeding Habitat (Ground)	Not Present	Not Present	Rocky islands and peninsulas are not present in the subject property or study area.
Migratory Butterfly Stopover Areas	Not Present	Not Present	The study area lies within 5km of Lake Erie and contains open field and treed habitats, but is not expected to contain enough nectaring plants in meadow areas to support the number of Monarch Use Days required to support this. The maintenance and upkeep of golf course lands is not conducive to supporting this SWH.
Landbird Migratory Stopover Areas	Candidate	Candidate	Woodlots of suitable size are present in the study area and subject property. The study area is within 5km of Lake Erie.
Deer Winter Congregation Areas	Not Present	Not Present	Deer wintering area has not been identified to occur within the subject property and study area.
Rare Vegetation Communities			
Cliff and Talus Slopes	Not Present	Not Present	Cliff and talus slope habitat have not been observed in the subject property or study area.
Sand Barrens	Not Present	Not Present	Sand barren habitat has not been observed in the subject property or study area.
Alvar	Not Present	Not Present	Alvar habitat has not been observed in the subject property or study area.
Old Growth Forest	Not Present	Not Present	Old growth forest habitat has not been identified in the subject property or study area.
Savannah	Not Present	Not Present	Savannah habitat has not been observed in the subject property or study area.
Tallgrass Prairie	Not Present	Not Present	Tallgrass prairie habitat has not been observed in the subject property or study area.
Other Rare Vegetation Communities	Not Present	Not Present	No rare vegetation communities were identified in the subject property or study area during the preliminary site investigation.
Specialized Wildlife Habitat			
Waterfowl Nesting Area	Possible	Not Present	Open aquatic features and adjacent upland habitat within the subject property are expected to be too disturbed to support waterfowl nesting. Waterfowl may utilize wetlands within the study area.
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat	Possible	Not Present	Nests may be found on large trees near the banks of Kettle Creek in the study area. Suitable nesting habitat is not present on the subject property.
Woodland Raptor Nesting Habitat	Possible	Not Present	Forests within the study area contain suitable interior habitat to support woodland raptor nesting. No stick nests were observed in continguous forest habitat on the subject property during the preliminary site investigation.
Turtle Nesting Areas	Not Present	Not Present	Edges of ponds and the watercourse within the subject property and study area are maintained by the golf course and are unlikely to provide suitable nesting SWH.
Seeps and Springs	Possible	Not Present	Two seeps were observed within the subject property; one within the FOD5-2 community at south end of the subject property, and the other within the FOD5-2 community at the northwest edge of subject property, occurring mainly off-property. Each will be protected. There was no ecosite that contained two or more seeps/springs within the subject property. Additional seeps and springs may be found within forest communities in the study area.

Significant Wildlife Habitat Type	Presence Within Study Area	Presence Within Subject Property	Assessment Details
Amphibian Breeding Habitat (Woodland)	Possible	Not Present	Watercourses are present, and wetlands and pools may be present, within the forest communities in the study area. Anuran call surveys did not confirm the presence of amphibian breeding habitat.
Amphibian Breeding Habitat (Wetland)	Not Present	Not Present	Anuran call surveys did not confirm sufficient presence of amphibian breeding habitat.
Woodland Area-Sensitive Bird Breeding Habitat	Possible	Not Present	Suitable breeding evidence for the listed species was not observed during breeding bird surveys.
Habitat for Species of Conservation Concern			
Marsh Bird Breeding Habitat	Not Present	Not Present	Breeding bird surveys were completed and did document the defining criteria. A Green Heron was observed within a golf course pond, but breeding evidence was not confirmed.
Open Country Bird Breeding Habitat	Not Present	Not Present	The subject property and study area lack grassland habitat of a suitable size. Agricultural fields within the study area are active and unsuitable.
Shrub/Early Successional Bird Breeding Habitat	Not Present	Not Present	The subject property and study area do not contain shrub and thicket habitat >10ha. Agricultural fields within the study area are active and unsuitable.
Terrestrial Crayfish	Possible	Not Present	The SWT2-2 wetland within the subject property had the potential to provide suitable habitat, but no chimneys were observed during the field program. Some wetlands are present with some distance to the subject property tha tmay provide suitable habitat, but would not be affected by the proposed development.
Special Concern and Rare Wildlife Species	Candidate	Confirmed	Snapping Turtle habitat is confirmed in the SWT2-2 wetland. Candidate habitat for Tufted Titmouse, Eastern Wood-pewee, Barn Swallow, Purple Martin, and Monarch is present within the subject property. Candidate habitat for Wood Thrush, Bank Swallow, and Red-headed Woodpecker is present within the study area.
Animal Movement Corridors			
Amphibian Movement Corridors	Possible	Possible	Suitbale breeding habitat was not documented through anuran call surveys, and suitable salamander habitat is not present on the eastern portion of the subject property or study area, but there is potential for salamander movement between FOD features in the protected western areas of the subject property.
Exceptions			
Bat Migratory Stopover Area	Not Present	Not Present	This subject property and study area occur outside of the known stopover habitat for bats.

Significant Wildlife Habitat Assessment Tables

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E (MNRF 2015)

	Candidate SWH			Confirmed SWH	Assessment Details	
Rationale	**Wildlife Species**	**ELC Ecosite Codes**	**Habitat Criteria and Information Sources**	**Defining Criteria**	**Study Area**	**Subject Property**
Wildlife Habitat: Waterfowl Stopover and Staging Areas (Terrestrial)					Possible	Not Present
Habitat important to migrating waterfowl	American Black Duck Northern Pintail Gadwall Blue-winged Teal Green-winged Teal American Wigeon Northern Shoveler Tundra Swan	CUM1 CUT1 - Plus evidence of annual spring flooding from melt water or run-off within these Ecosites. - Fields with seasonal flooding and waste grain in the Long Point, Rondeau, Lake. St. Clair, Grand Bend and Pt. Pelee areas may be important to Tundra Swans.	Fields with sheet water during Spring (mid March to May). • Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl. • Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless they have spring sheet water available[cxlviii] <u>Information Sources</u> • Anecdotal information from the landowner, adjacent landowners or local naturalist clubs may be good information in determining occurrence. • Reports and other information available from Conservation Authorities (CAs) • Sites documented through waterfowl planning processes (eg. EHJV implementation plan) • Field Naturalist Clubs • Ducks Unlimited Canada • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • Any mixed species aggregations of 100[j] or more individuals required. • The area of the flooded field ecosite habitat plus a 100-300m radius buffer dependant on local site conditions and adjacent land use is the significant wildlife habitat[cxlviii]. • Annual use of habitat is documented from information sources or field studies (annual use can be based on studies or determined by past surveys with species numbers and dates). • SWHMIST[cxlix] Index #7 provides development effects and mitigation measures.	Agricultural fields found in the study area may flood with sheet water but would be unaffected by the proposed development. Sheet water flooding does not occur within the subject property.	
Wildlife Habitat: Waterfowl Stopover and Staging Areas (Aquatic)					Not Present	Not Present
Important for local and migrant waterfowl populations during the spring or fall migration or both periods combined. Sites identified are usually only one of a few in the eco-district	Canada Goose Cackling Goose Snow Goose Green-winged Teal American Black Duck Northern Pintail Northern Shoveler American Wigeon Gadwall Blue-winged Teal Hooded Merganser Common Merganser Red-breasted Merganser Lesser Scaup Greater Scaup Common Goldeneye Bufflehead Long-tailed Duck Surf Scoter White-winged Scoter Black Scoter Canvasback Redhead Ruddy Duck Brant White-winged Scoter Black Scoter	MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7	• Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify. • These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water). <u>Information Sources</u> • Environment Canada • Naturalist clubs often are aware of staging/stopover areas • OMNRF Wetland Evaluations indicate presence of locally and regionally significant waterfowl staging. • Sites documented through waterfowl planning processes (eg. EHJV implementation plan) • Ducks Unlimited projects • Element occurrence specification by Nature Serve: http://www.natureserve.org • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of: • Aggregations of 100[j] or more of listed species for 7 days[j], results in >700 waterfowl use days. • Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH[cxlix] • The combined area of the ELC ecosites and a 100m radius area is the SWH[cxlviii] • Wetland area and shorelines associated with sites identified within the SWHTG[cxlviii] Appendix K[cxlix] are significant wildlife habitat. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species numbers and dates recorded). • SWHMIST[cxlix] Index #7 provides development effects and mitigation measures.	Water bodies within the subject property and study area are limited to constructed ponds within the golf course, which do not qualify as SWH.	

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E (MNRF 2015)

	Candidate SWH			Confirmed SWH	Assessment Details	
Rationale	**Wildlife Species**	**ELC Ecosite Codes**	**Habitat Criteria and Information Sources**	**Defining Criteria**	**Study Area**	**Subject Property**
Wildlife Habitat: Shorebird Migratory Stopover Area					Not Present	Not Present
High quality shorebird stopover habitat is extremely rare and typically has a long history of use	Greater Yellowlegs Lesser Yellowlegs Marbled Godwit Hudsonian Godwit Black-bellied Plover American Golden-Plover Semipalmated Plover Solitary Sandpiper Spotted Sandpiper Semipalmated Sandpiper Pectoral Sandpiper White-rumped Sandpiper Baird's Sandpiper Least Sandpiper Purple Sandpiper Stilt Sandpiper Short-billed Dowitcher Red-necked Phalarope Whimbrel Ruddy Turnstone Sanderling Dunlin	BBO1 BBO2 BBS1 BBS2 BBT1 BBT2 SDO1 SDS2 SDT1 MAM1 MAM2 MAM3 MAM4 MAM5	Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. Sewage treatment ponds and storm water ponds do not qualify as a SWH. <u>Information Sources</u> • Western hemisphere shorebird reserve network • Canadian Wildlife Service (CWS) Ontario Shorebird Survey • Bird Studies Canada • Ontario Nature • Local birders and naturalist clubs • Natural Heritage Information Center (NHIC) Shorebird Migratory Concentration Area	Studies confirming: • Presence of 3 or more of listed species and > 1000[i] shorebird use days during spring or fall migration period (shorebird use days are the accumulated number of shorebirds counted per day over the course of the fall or spring migration period). • Whimbrel stop briefly (<24hrs) during spring migration, any site with >100[i] Whimbrel used for 3 years or more is significant. • The area of significant shorebird habitat includes the mapped ELC shoreline ecosites plus a 100m radius area[cxlviii] • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMIST[cxlix] Index #8 provides development effects and mitigation measures.	Shoreline habitat is not present within the subject property or study area.	
Wildlife Habitat: Raptor Wintering Area					Possible	Not Present
Sites used by multiple species, a high number of individuals and used annually are most significant	Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl <u>Special Concern</u>: Short-eared Owl Bald Eagle	<u>Hawks/Owls:</u> Combination of ELC Community Series; need to have present one Community Series from each land class. Forest: FOD, FOM, FOC Upland: CUM, CUT, CUS, CUW <u>Bald Eagle:</u> Forest Community Series: FOD, FOM, FOC, SWD, SWM, or SWC, on shoreline areas adjacent to large rivers or adjacent to lakes with open water (hunting area).	The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. Raptor wintering (hawk/owl) sites need to be > 20ha[cxlviii, cxlix] with a combination of forest and upland[xvi, xvii, xviii, xix, xx, xxi]. Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands[cxlix] Field area of the habitat is to be wind swept with limited snow depth or accumulation. Eagle sites have open water and large trees and snags aviable for roosting[cxlix] <u>Information Sources</u> • OMNRF Districts • Natural clubs • Natural Heritage Information Centre (NHIC) Raptor Winter Concentration Area • Data from Bird Studies Canada • Reports and other information available from CAs • Results of Christmas Bird Counts	Studies confirm the use of these habitats by: • One or more Short-eared Owls, or, One of more Bald Eagles or; at least 10 individuals and two listed hawk/owl species • To be significant a site must be used regularly (3 in 5 years)[cxlix] for a minimum of 20 days by the above number of birds[i]. • The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMIST[cxlix] Index #10 and #11 provides development effects and mitigation measures.	The study area contains large woodlands adjacent to agricultural fields that may provide suitable wintering raptor habitat. No suitable stick nests were observed during the field program.	

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E (MNRF 2015)

	Candidate SWH			Confirmed SWH	Assessment Details	
Rationale	**Wildlife Species**	**ELC Ecosite Codes**	**Habitat Criteria and Information Sources**	**Defining Criteria**	**Study Area**	**Subject Property**
Wildlife Habitat: Bat Hibernacula					Not Present	Not Present
Bat hibernacula, are rare habitats in all Ontario landscapes.	Big Brown Bat Eastern Pipistrelle/Tri-colored Bat	Bat Hibernacula may be found in these ecosites: CCR1 CCR2 CCA1 CCA2 (Note: buildings are not considered to be SWH)	Hibernacula may be found in caves, mine shafts, underground foundations and Karsts. Active mine sites should not be considered The locations of bat hibernacula are relatively poorly known. <u>Information Sources</u> • OMNRF for possible locations and contact for local experts • Natural Heritage Information Centre (NHIC) Bat Hibernaculum • Ministry of Northern Development and Mines for location of mine shafts • Clubs that explore caves (eg. Sierra Club) • University Biology Departments with bat experts	• All sites with confirmed hibernating bats are SWH[l]. • The area includes 200m radius around the entrance of the hibernaculum[cxlviii, ccvii, l]. for the development types and 1000m for wind farms [ccv]. • Studies are to be conducted during the peak swarming period (Aug. – Sept.). Surveys should be conducted following methods outlined in the[ccv]."Bats and Bat Habitats: Guidelines for Wind Power Projects" [ccv] • SWHMIST[cxlix] Index #1 provides development effects and mitigation measures.	The subject property and study area are not expected to contain caves, mine shafts, underground foundations, or karsts.	
Wildlife Habitat: Bat Maternity Colonies					Candidate	Candidate
Known locations of forested bat maternity colonies are extremely rare in all Ontario landscapes.	Big Brown Bat Silver-haired Bat	Maternity colonies considered SWH are found in forested Ecosites. All ELC Ecosites in ELC Community Series: FOD FOM SWD SWM	Maternity colonies can be found in tree cavities, vegetation and often in building [sxxii, xxv, xxvi, xxvii, xxxi] (buildings are not considered to be SWH). • Maternity roosts are not found in caves and mines in Ontario[xxii]. • Maternity colonies located in Mature deciduous or mixed forest stands[ccix, ccx] with >10/ha large diameter (>25cm dbh) wildlife trees[ccvii]. • Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3[ccxiv] or class 1 or 2[ccxii]. • Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred[ccx]. <u>Information Sources</u> • OMNRF for possible locations and contact for local experts • University Biology Departments with bat experts	Maternity Colonies with confirmed use by: • >10 Big Brown Bats[l] • >5 Adult Female Silver-haired Bats[l] • The area of the habitat includes the entire woodland or the forest stand ELC Ecosite containing the maternity colonies[l]. • Evaluation methods for maternity colonies should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for Wind Power Projects"[ccv]. • SWHMIST[cxlix] Index #12 provides development effects and mitigation measures.	Trees in woodlands within subject property and study area may have suitable, large wildlife trees to support bat maternity colonies. Several bat habitat trees were observed during bat habitat assessment within the subject property.	

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E (MNRF 2015)

	Candidate SWH			Confirmed SWH	Assessment Details	
Rationale	**Wildlife Species**	**ELC Ecosite Codes**	**Habitat Criteria and Information Sources**	**Defining Criteria**	**Study Area**	**Subject Property**
Wildlife Habitat: Turtle Wintering Area					Possible	Candidate
Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant.	Midland Painted Turtle <u>Special Concern</u>: Northern Map Turtle Snapping Turtle	Snapping and Midland Painted Turtles: ELC Community Classes: SW, MA, OA and SA ELC Community Series: FEO and BOO Northern Map Turtle: Open Water areas such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.	• For most turtles, wintering areas are in the same general area as their core habitat. Water has to be deep enough not to freeze and have soft mud substrates. • Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen[cix, cx, cxi, cxviii]. • Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH <u>Information Sources</u> • EIS studies carried out by Conservation Authorities • Field naturalists clubs • OMNRF Ecologist or Biologist • Natural Heritage Information Centre (NHIC)	• Presence of 5 over-wintering Midland Painted Turtles is significant[l]. • One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant[l]. • The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH. • Over wintering areas may be identified by searching for congregations (Basking Areas) of turtles on warm, sunny days during the fall (Sept. – Oct.) or spring (Mar. – May)[cvii]. Congregation of turtles is more common where wintering areas are limited and therefore significant[cix, cx, cxi, cxii]. • SWHMIST[cxlix] Index #28 provides development effects and mitigation measures for turtle wintering habitat.	The MAS2 and SWD communities within the subject property has been treated as confirmed wintering habitat for Snapping Turtle based on the observation of three young basking individuals during the spring timing window. The constructed ponds on the subject property is not likely to provide wintering habitat as turtles were not observed during any of the turtle basking surveys. The portion of Kettle Creek that falls within the the study area may also provide suitable habitat.	
Wildlife Habitat: Reptile Hibernaculum					Candidate	Candidate
Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant	<u>Snakes:</u> Eastern Gartersnake Northern Watersnake Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake <u>Special Concern</u>: Milksnake Eastern Ribbonsnake	For all snakes, habitat may be found in any ecosite in southern Ontario other than very wet ones. Talus, Rock Barren, Crevice and Cave, and Alvar sites may be directly related to these habitats. Observations of congregations of snakes on sunny warm days in the spring or fall is a good indicator. The existence of rock piles or slopes, stone fences, and crumbling foundations assist in identifying candidate SWH.	For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural locations. Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line[xliv, l, li, lii, cxii]. Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover. <u>Information Sources</u> • In spring, local residents or landowners may have observed the emergence of snakes on their property (e.g. old dug wells). • Reports and other information available from CAs • Local naturalists and experts, as well as university herpetologists may also know where to find some of these sites. • Natural Heritage Information Centre (NHIC)	Studies confirming: • Presence of snake hibernacula used by a minimum of five individuals of a snake sp., or, individuals of two or more snake spp. • Congregations of a minimum of five individuals of a snake sp., or, individuals of two or more snake spp. near potential hibernacula (eg. foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct)[l]. • Note: If there are Special Concern Species present, then site is SWH • Note: Sites for hibernation possess specific habitat parameters (e.g. temperature, humidity, etc.) and consequently are used annually, often by many of the same individuals of a local population (i.e. strong hibernation site fidelity). Other critical life processes (e.g. mating) often take place in close proximity to hibernacula. The feature in which the hibernacula is located plus a 30m buffer is the SWH[l]. • SWHMIST[cxlix] Index #13 provides development effects and mitigation measures for snake hibernacula.	Snake hibernacula may occur throughout the protected naturalized portions of the subject property and study area.	

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E (MNRF 2015)

	Candidate SWH			Confirmed SWH	Assessment Details	
Rationale	**Wildlife Species**	**ELC Ecosite Codes**	**Habitat Criteria and Information Sources**	**Defining Criteria**	**Study Area**	**Subject Property**
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Bank and Cliff)					Possible	Not Present
Historical use and number of nests in a colony make this habitat significant. An identified colony can be very important to local populations. All swallow population are declining in Ontario.	Cliff Swallow Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies)	Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles Cliff faces, bridge abutments, silos, barns Habitat found in the following ecosites: CUM1 CUT1 CUS1 BLO1 BLS1 BLT1 CLO1 CLS1 CLT1	• Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area. • Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles. • Does not include a licensed/permitted Mineral Aggregate Operation. <u>Information Sources</u> • Reports and other information available from CAs • Ontario Breeding Bird Atlas[ccv]. • Bird Studies Canada: Nature Counts http://www.birdscanada.org/birdmon/ • Field Naturalist clubs	Studies confirming: • Presence of 1 or more nesting sites with 8[cxlvix] or more cliff swallow pairs and/or rough-winged swallow pairs during the breeding season. • A colony identified as SWH will include a 50m radius habitat area from the peripheral nests[ccvii]. • Field surveys to observe and count swallow nests are to be completed during the breeding season. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”[ccxi]. • SWHMIST[cxlix] Index #4 provides development effects and mitigation measures.	The subject property does not contain exposed banks suitable for swallow nesting. Exposed soil may be found on the banks of Kettle Creek within the study area.	
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs)					Not Present	Not Present
Large colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Great Blue Heron Black-crowned Night-Heron Great Egret Green Heron	SWM2 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1	• Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used. • Most nests in trees are 11 to 15 m from ground, near the top of the tree. <u>Information Sources</u> • Ontario Breeding Bird Atlas[ccv], colonial nest records. • Ontario Heronry Inventory 1991 available from Bird Studies Canada or NHIC (OMNRF). • Natural Heritage Information Centre (NHIC) Mixed Wader Nesting Colony • Aerial photographs can help identify large heronries. • Reports and other information available from CAs • MNRF District Offices • Field naturalist clubs	Studies confirming: • Presence of 2 or more active nests of Great Blue Heron or other list species. • The habitat extends from the the edge of the colony and a minimum 300m radius or extent of the Forest Ecosite containing the colony or any island <15.0ha with a colony is the SWH[cc, ccvii]. • Confirmation of active colonies must be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the presence of fresh guano, dead young and/or eggshells • SWHMIST[cxlix] Index #5 provides development effects and mitigation measures.	Wetlands with standing dead trees are not present in the subject property or study area. Suitable species with confirmed breeding evidence were not observed during breeding bird surveys or incidentally through the field program.	

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E (MNRF 2015)

	Candidate SWH			Confirmed SWH	Assessment Details	
Rationale	**Wildlife Species**	**ELC Ecosite Codes**	**Habitat Criteria and Information Sources**	**Defining Criteria**	**Study Area**	**Subject Property**
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Ground)					Not Present	Not Present
Colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern Caspian Tern Brewer's Blackbird	Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1:50,000 NTS map). Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird) MAM1 – 6 MAS1 – 3 CUM CUT CUS	• Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas. • Brewers Blackbird colonies are found loosely on the ground in or in low bushes in close proximity to streams and irrigation ditches within farmlands. <u>Information Sources</u> • Ontario Breeding Bird Atlas[ccv], rare/colonial species records. • Canadian Wildlife Service • Reports and other information available from CAs • Natural Heritage Information Centre (NHIC) Colonial Waterbird Nesting Area • MNRF District Offices • Field naturalist clubs	Studies confirming: • Presence of >25 active nests for Herring Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern[i]. • Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant[i]. • Presence of 5 or more pairs for Brewer's Blackbird[i]. • The edge of the colony and a minimum 150m radius area of the habitat, or the extent of the ELC ecosites containing the colony or any island <3.0ha with a colony is the SWH[cc, ccvii]. • Studies would be done during May/June when actively nesting. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi]. • SWHMIST[cxlix] Index #6 provides development effects and mitigation measures.	Rocky islands and peninsulas are not present in the subject property or study area.	
Wildlife Habitat: Migratory Butterfly Stopover Areas					Not Present	Not Present
<u>Rationale:</u> Butterfly stopover areas are extremely rare habitats and are biologically important for butterfly species that migrate south for the winter	Painted Lady Red Admiral <u>Special Concern</u>: Monarch	Combination of ELC Community Series; need to have present one Community Series from each landclass: Field: CUM CUT CUS Forest: FOC FOD FOM CUP Anecdotally, a candidate sight for butterfly stopover will have a history of butterflies being observed.	A butterfly stopover area will be a minimum of 10ha in size with a combination of field and forest habitat present, and will be located within 5km of Lake Ontario and Erie[cxlix]. • The habitat is typically a combination of field and forest, and provides the butterflies with a location to rest prior to their long migration south [xxxii, xxxiii, xxxiv, xxxv, xxxvi]. • The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat [cxlviii, cxlix]. • Staging areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes [xxxvii, xxxviii, xxxix, xl, xli]. <u>Information Sources</u> • MNRF District Offices • Natural Heritage Information Centre (NHIC) • Agriculture Canada in Ottawa may have list of butterfly experts. • Field Naturalist Clubs • Toronto Entomologists Association • Conservation Authorities	Studies confirm: • The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct)[xliii]. MUD is based on the number of days a site is used by Monarchs, multiplied by the number of individuals using the site. Numbers of butterflies can range from 100-500/day[xxxvii], significant variation can occur between years and multiple years of sampling should occur[xl, xlii]. • Observational studies are to be completed and need to be done frequently during the migration period to estimate MUD • MUD of >5000 or >3000 with the presence of Painted Ladies or Red Admiral's is to be considered significant[l]. • SWHMIST[cxlix] Index #16 provides development effects and mitigation measures.	The study area lies within 5km of Lake Erie and contains open field and treed habitats, but is not expected to contain enough nectaring plants in meadow areas to support the number of Monarch Use Days required to support this. The maintenance and upkeep of golf course lands is not conducive to supporting this SWH.	

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E (MNRF 2015)

	Candidate SWH			Confirmed SWH	Assessment Details	
Rationale	**Wildlife Species**	**ELC Ecosite Codes**	**Habitat Criteria and Information Sources**	**Defining Criteria**	**Study Area**	**Subject Property**
Wildlife Habitat: Landbird Migratory Stopover Areas					Candidate	Candidate
Sites with a high diversity of species as well as high numbers are most significant	All migratory songbirds Canadian Wildlife Service Ontario website: http://www.on.ec.gc.ca/wildlife_e.html All migrant raptors species Ontario Ministry of Natural Resources: Fish and Wildlife Conservation Act, 1997. Schedule 7: Specially Protected Birds (Raptors)	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD	Woodlots need to be >5 ha[I] in size and within 5km [iv, v, vi, vii, viii, ix, x, xi, xii, xiii, xiv, xv] of Lake Ontario and Erie. If woodlands are rare in an area of shoreline, woodland fragments 2-5ha can be considered for this habitat • If multiple woodlands are located along the shoreline those Woodlands <2km from Lake Erie or Ontario are more significant[cxlix]. • Sites have a variety of habitats: forest, grassland and wetland complexes[cxlix]. • The largest sites are more significant[cxlix] • Woodlots and forest fragments are important habitats to migrating birds[ccxviii], these features located along the shore and located within 5km of Lake Ontario and Lake Erie are Candidate SWH[cxlviii]. <u>Information Sources</u> • Bird Studies Canada • Ontario Nature • Local birders and naturalist clubs • Ontario Important Bird Areas (IBA) Program	Studies confirm: • Use of the habitat by >200 birds/day and with >35 spp. with at least 10 bird spp. recorded on at least 5 different survey dates[I]. This abundance and diversity of migrant bird species is considered above average and significant. • Studies should be completed during spring (March/May) and fall (Aug/Oct) migration using standardized assessment techniques. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi]. • SWHMIST[cxlix] Index #9 provides development effects and mitigation measures.	Woodlots of suitable size are present in the study area and subject property. The study area is within 5km of Lake Erie.	
Wildlife Habitat: Deer Winter Congregation Areas					Not Present	Not Present
Deer movement during winter in the southern areas of Ecoregion 7E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands to reduce or avoid the impacts of winter conditions [cxlviii]	White-tailed Deer	All Forested Ecosites with these ELC Community Series: FOC FOM FOD SWC SWM SWD Conifer plantations (CUP) smaller than 50 ha may also be used.	• Woodlots >100 ha in size or if large woodlots are rare in a planning area woodlots>50ha[I]. • Deer movement during winter in Ecoregion 7E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands[cxlviii]. • Large woodlots > 100ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha[ccxxiv]. • Woodlots with high densities of deer due to artificial feeding are not significant[I]. <u>Information Sources</u> • MNRF District Offices • LIO/NRVIS	Studies confirm: • Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF[cxlviii]. • Use of the woodlot by white-tailed deer will be determined by MNRF, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNRF[I]. • Studies should be completed during winter (Jan/Feb) when >20cm of snow is on the ground using aerial survey techniques[ccxxiv], ground or road surveys, or a pellet count deer density survey[ccxxv]. • SWHMIST[cxlix] Index #2 provides development effects and mitigation measures.	Deer wintering area has not been identified to occur within the subject property and study area.	

Significant Wildlife Habitat Assessment Tables

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 7E (MNRF 2015)

	Candidate SWH			Confirmed SWH	Assessment Details	
Rationale	**ELC Ecosite Codes**	**Habitat Description**	**Detailed Information and Sources**	**Defining Criteria**	**Study Area**	**Subject Property**
Cliff and Talus Slopes					Not Present	Not Present
Cliffs and Talus Slopes are extremely rare habitats in Ontario.	Any ELC Ecosite within Community Series: TAO TAS TAT CLO CLS CLT	A Cliff is vertical to near vertical bedrock >3m in height. A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris.	Most cliff and talus slopes occur along the Niagara Escarpment. <u>Information Sources</u> • The Niagara Escarpment Commission has detailed information on location of these habitats. • OMNRF Districts • Natural Heritage Information Centre (NHIC) has location information available on their website • Field naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Cliffs or Talus Slopes[lxxviii] • SWHMIST[cxlix] Index #21 provides development effects and mitigation measures.	Cliff and talus slope habitat have not been observed in the subject property or study area.	
Sand Barrens					Not Present	Not Present
Sand barrens are rare in Ontario and support rare species. Most Sand Barrens have been lost due to cottage development and forestry.	ELC Ecosites: SBO1 SBS1 SBT1 Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always ≤ 60%.	Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. They have little or no soil and the underlying rock protrudes through the surface. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered but less than 60%.	A sand barren area >0.5ha in size <u>Information Sources</u> • OMNRF Districts • Natural Heritage Information Centre (NHIC) has location information available on their website • Field naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Sand Barrens[lxxviii] • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotics sp)[i]. • SWHMIST[cxlix] Index #20 provides development effects and mitigation measures.	Sand barren habitat has not been observed in the subject property or study area.	

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 7E (MNRF 2015)

	Candidate SWH			Confirmed SWH	Assessment Details	
Rationale	**ELC Ecosite Codes**	**Habitat Description**	**Detailed Information and Sources**	**Defining Criteria**	**Study Area**	**Subject Property**
Alvar					Not Present	Not Present
Alvars are extremely rare habitats in Ecoregion 7E	ALO1 ALS1 ALT1 FOC1 FOC2 CUM2 CUS2 CUT2-1 CUW2 Five Alvar Indicator Species: 1) *Carex crawei* 2) *Panicum philadelphicum* 3) *Eleocharis compressa* 4) *Scutellaria parvula* 5) *Trichostema brachiatum* These indicator species are very specific to Alvars within Ecoregion 7E[cxlix]	An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plant. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animals species. Vegetation cover varies from patchy to barren with a less than 60% tree cover[lxxviii].	An Alvar site > 0.5ha in size[lxxv]. Alvar is particularly rare in Ecoregion 7E where the only known sites are found in the western islands of Lake Erie[cxcix]. <u>Information Sources</u> • Alvars of Ontario (2000), Federation of Ontario Naturalists[lxxvi]. • Ontario Nature – Conserving Great Lakes Alvars[ccviii]. • Natural Heritage Information Centre (NHIC) has location information available on their website • OMNRF Staff • Field Naturalist clubs • Conservation Authorities	Field studies identify four of the five **Alvar indicator species**[lxxv] at a candidate Alvar site is Significant • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). • The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses[lxxv]. • SWHMIST[cxlix] Index #17 provides development effects and mitigation measures.	Alvar habitat has not been observed in the subject property or study area.	

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 7E (MNRF 2015)

	Candidate SWH			Confirmed SWH	Assessment Details	
Rationale	**ELC Ecosite Codes**	**Habitat Description**	**Detailed Information and Sources**	**Defining Criteria**	**Study Area**	**Subject Property**
Old Growth Forest					Not Present	Not Present
Due to historic logging practices and land clearance for agriculture, old growth forest is rare in Ecoregion 7E.	Forest Community Series: FOD FOC FOM SWD SWC SWM	Old growth forests are characterized by heavy mortality or turnover of overstorey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris.	Woodland area is >0.5ha <u>Information Sources</u> • OMNRF Forest Resource Inventory mapping • OMNRF Districts • Field naturalist clubs • Conservation Authorities • Sustainable Forestry Licence (SFL) companies will possibly know locations through field operations. • Municipal forestry departments	Field Studies will determine: • If dominant trees species of the ecosite are >140 years old, then stand is Significant Wildlife Habitat[cxlviii]. • The forested area containing the old growth characteristics will have experienced no recognizable forestry activities [cxlviii] (cut stumps will not be present) • Determine ELC Vegetation Type for forest area containing the old growth characteristics[lxxviii]. • SWHMIST[cxlix] Index #23 provides development effects and mitigation measures.	Old growth forest habitat has not been identified in the subject property or study area.	
Savannah					Not Present	Not Present
Savannahs are extremely rare habitats in Ontario.	TPS1 TPS2 TPW1 TPW2 CUS2	A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%. In Ecoregion 7E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario)[cc].	No minimum size to site[l] Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. <u>Information Sources</u> • OMNRF Districts • Natural Heritage Information Centre (NHIC) has location data available on their website • Field naturalists clubs • Conservation Authorities	Field studies confirm one or more of the Savannah indicator species listed in[lxxv] Appendix N should be present[l]. Note: Savannah plant spp. list from Ecoregion 7E should be used. • Area of the ELC Vegetation type is the SWH[lxxviii]. • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). • SWHMIST[cxlix] Index #18 provides development effects and mitigation measures.	Savannah habitat has not been observed in the subject property or study area.	

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 7E (MNRF 2015)

	Candidate SWH			Confirmed SWH	Assessment Details	
Rationale	**ELC Ecosite Codes**	**Habitat Description**	**Detailed Information and Sources**	**Defining Criteria**	**Study Area**	**Subject Property**
Tallgrass Prairie					Not Present	Not Present
Tallgrass Prairies are extremely rare habitats in Ontario.	TPO1 TPO2	A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover. In Ecoregion 7E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario)[cc].	No minimum size to site[i]. Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. <u>Information Sources</u> • Natural Heritage Information Centre (NHIC has location information available on their website • OMNRF Districts • Field naturalists clubs • Conservation Authorities	Field studies confirm one or more of the Prairie indicator species listed in[lxxv] Appendix N should be present[i]. Note: Prairie plant spp. list from Ecoregion 7E should be used. • Area of the ELC Vegetation Type is the SWH[lxxviii]. • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). • SWHMIST[cxlix] Index #19 provides development effects and mitigation measures.	Tallgrass prairie habitat has not been observed in the subject property or study area.	
Other Rare Vegetation Communities					Not Present	Not Present
Plant communities that often contain rare species which depend on the habitat for survival.	Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG[cxlviii]. Any ELC Ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH.	Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps.	ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in appendix M[cxlviii]. The OMNRF/NHIC will have up to date listing for rare vegetation communities. <u>Information Sources</u> • Natural Heritage Information Centre (NHIC) has location information available on their website • OMNRF Districts • Field naturalists clubs • Conservation Authorities	Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWHTG[cxlviii]. • Area of the ELC Vegetation Type polygon is the SWH. • SWHMIST[cxlix] Index #37 provides development effects and mitigation measures.	No rare vegetation communities were identified in the subject property or study area during the preliminary site investigation.	

Significant Wildlife Habitat Assessment Tables

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E (MNRF 2015)

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Waterfowl Nesting Area					Possible	Not Present
Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant	American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard	All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SWT1 SWT2 SWD1 SWD2 SWD3 SWD4 **Note: includes adjacency to Provincially Significant Wetlands**	A waterfowl nesting area extends: 120m[cxlix] from a wetland (>0.5ha) or a wetland (>0.5ha) with small wetlands (0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120m of each individual wetland where waterfowl nesting is known to occur[cxlix]. • Upland areas should be at least 120m wide so that predators such as racoons, skunks, and foxes have difficulty finding nests. • Wood Ducks and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites. <u>Information Sources</u> • Ducks Unlimited staff may know the locations of particularly productive nesting sites. • OMNRF Wetland Evaluations for indication of significant waterfowl nesting habitat. • Reports and other information available from CAs	Studies confirmed: • Presence of 3 or more nesting pairs for listed species excluding Mallards[í], or, • Presence of 10 or more nesting pairs for listed species including Mallards[í]. • Any active nesting site of an American Black Duck is considered significant. • Nesting studies should be completed during the spring breeding season (April - June). Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • A field study confirming waterfowl nesting habitat will determine the boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120m[cxlviii] from the wetland and will provide enough habitat for waterfowl to successfully nest. • SWHMIST[cxlix] Index #25 provides development effects and mitigation measures.	Open aquatic features and adjacent upland habitat within the subject property are expected to be too disturbed to support waterfowl nesting. Waterfowl may utilize wetlands within the study area.	

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E (MNRF 2015)

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Bald Eagle and Osprey Nesting, Foraging and Perching Habitat					Possible	Not Present
Nest sites are fairly uncommon in Ecoregion 7E and are used annually by these species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat.	Osprey Special Concern: Bald Eagle	ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands.	Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy. Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms). Information Sources • Natural Heritage Information Center (NHIC) compiles all known nesting sites for Bald Eagles in Ontario • MNRF values information (LIO/NRVIS) will list known nesting locations, Note: data from NRVIS is provided as a point format and does not include all the habitat. • Nature Counts, Ontario Nest Records Scheme data • OMNRF Districts • Check the Ontario Breeding Bird Atlas[ccv] or Rare Breeding Birds in Ontario for species documented • Reports and other information available from CAs • Field naturalists clubs	Studies confirm the use of these nests by: • One or more active Osprey or Bald Eagle nests in an area[cxlviii]. • Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH. • For an Osprey, the active nest and a 300m radius around the nest or the contiguous woodland stand is the SWH[ccvii], maintaining undisturbed shorelines with large trees within this area is important[cxlviii]. • For a Bald Eagle the active nest and a 400-800m radius around the nest is the SWH[cvi, ccvii]. Area of the habitat from 400-800m is dependant on site lines from the nest to the development and inclusion of perching and foraging habitat[cvi]. • To be significant a site must be used annually. When found inactive, the site must be known to be inactive for ≥3 years or suspected of not being used for >5 years before being considered not significant[ccvii]. • Observational studies to determine nest site use, perching sites and foraging areas need to be done from mid March to mid August. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMIST[cxlix] Index #26 provides development effects and mitigation measures.	Nests may be found on large trees near the banks of Kettle Creek in the study area. Suitable nesting habitat is not present on the subject property.	

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E (MNRF 2015)

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Woodland Raptor Nesting Habitat					Possible	Not Present
Nests sites for these species are rarely identified; these area sensitive habitats are often used annually by these species.	Northern Goshawk Cooper's Hawk Sharp-shinned Hawk Red-shouldered Hawk Barred Owl Broad-winged Hawk	May be found in all forested ELC Ecosites. May also be found in SWC, SWM, SWD and CUP3	All natural or conifer plantation woodland/forest stands combined >30ha or with >4ha of interior habitat[lxxxviiii, lxxxix, xc, xci, xciii, xciv, xcv,xcvi, cxxxiii]. Interior habitat determined with a 200m buffer[cxlviii]. • Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Coopers hawk nest along forest edges sometimes on peninsulas or small off-shore islands. • In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest. <u>Information Sources</u> • OMNRF Districts • Check the Ontario Breeding Bird Atlas[ccv] or Rare Breeding Birds in Ontario for species documented. • Check data from Bird Studies Canada • Reports and other information available from CAs	Studies confirm: • Presence of 1 or more active nests from species list is considered significant[cxlviii]. • Red-shouldered Hawk and Northern Goshawk – A 400m radius around the nest or 28 ha of habitat is the SWH[ccvii].(the 28ha habitat area would be applied where optimal habitat is irregularly shaped around the nest) • Barred Owl – A 200m radius around the nest is the SWH[ccvii]. • Broad-winged Hawk and Coopers Hawk – A 100m radius around the nest is the SWH[ccvii]. • Sharp-Shinned Hawk – A 50m radius around the nest is the SWH[ccvii]. • Conduct field investigations from early March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area. • SWHMIST[cxlix] Index #27 provides development effects and mitigation measures.	Forests within the study area contain suitable interior habitat to support woodland raptor nesting. No stick nests were observed in continguous forest habitat on the subject property during the preliminary site investigation.	
Wildlife Habitat: Turtle Nesting Area					Not Present	Not Present
These habitats are rare and when identified will often be the only breeding site for local populations of turtles.	Midland Painted Turtle <u>Special Concern</u>: Northern Map Turtle Snapping Turtle	Exposed mineral soil (sand or gravel) areas adjacent (<100m)[cxlviii] or within the following ELC Ecosites: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 BOO1 FEO1	• Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. • For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. • Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used. <u>Information Sources</u> • Use Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels). • Check the Ontario Herpetofaunal Summary Atlas records or other similar atlases for uncommon turtles; location information may help to find potential nesting habitat for them. • Natural Heritage Information Center (NHIC) Field naturalist clubs	Studies confirm: • Presence of 5 or more nesting Midland Painted Turtles[l] • One or more Northern Map Turtle or Snapping Turtle nesting is a SWH[l] • The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100m around the nesting area dependant on slope, riparian vegetation and adjacent land use is the SWH[cxlviii]. • Travel routes from wetland to nesting area are to be considered within the SWH as part of the 30-100m area of habitat[cxlix]. • Field investigations should be conducted in prime nesting season typically late spring to early summer. Observation studies observing the turtles nesting is a recommended method. • SWHMIST[cxlix] Index #28 provides development effects and mitigation measures for turtle nesting habitat.	Edges of ponds and the watercourse within the subject property and study area are maintained by the golf course and are unlikely to provide suitable nesting SWH.	

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E (MNRF 2015)

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Seeps and Springs					Possible	Not Present
Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams	Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer Salamander spp.	Seeps/Springs are areas where ground water comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system[cxvii, cxlix]. • Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species[cxix, cxx, cxxi, cxxii, cxiii, cxiv]. <u>Information Sources</u> • Topographical Map • Thermography • Hydrological surveys conducted by CAs and MOE • Field naturalists and landowners • Municipalities and Conservation Authorities may have drainage maps and headwater areas mapped	Field Studies confirm: • Presence of a site with 2 or more[i] seeps/springs should be considered SWH. • The area of a ELC forest ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation of the habitat[cxlviii]. • SWHMIST[cxlix] Index #30 provides development effects and mitigation measures.	Two seeps were observed within the subject property; one within the FOD5-2 community at south end of the subject property, and the other within the FOD5-2 community at the northwest edge of subject property, occurring mainly off-property. Each will be protected. There was no ecosite that contained two or more seeps/springs within the subject property. Additional seeps and springs may be found within forest communities in the study area.	
Wildlife Habitat: Amphibian Breeding Habitat (Woodland)					Possible	Not Present
These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians.	• Presence of a wetland, pond or woodland pool (including vernal pools) >500m^2 (about 25m diameter) [ccvii] within or adjacent (within 120m) to a woodland (no minimum size)[clxxxii, lxiii, lxv, lxvi, lxvii, lxviii, lxix, lxx]. Some small wetlands may not be mapped and may be important breeding pools for amphibians. • Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat[cxlviii]. <u>Information Sources</u> • Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records • Local landowners may also provide assistance as they may hear spring-time choruses of amphibians on their property. • OMNRF Districts and wetland evaluations • Field naturalist clubs • Canadian Wildlife Service Amphibian Road Call Survey • Ontario Vernal Pool Association: http://www.ontariovernalpools.org	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog/toad species with Call Level Codes of 3. • A combination of observational study and call count surveys [cviii] will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands. • The habitat is the wetland area plus a 230m radius of woodland area[lxiii, lxv, lxvi, lxvii, lxviii, lxix, lxx, lxxi]. If a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is to be included in the habitat. • SWHMIST[cxlix] Index #14 provides development effects and mitigation measures.	Watercourses are present, and wetlands and pools may be present, within the forest communities in the study area. Anuran call surveys did not confirm the presence of amphibian breeding habitat.	

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E (MNRF 2015)

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Amphibian Breeding Habitat (Wetland)					Not Present	Not Present
Wetlands supporting breeding for these amphibian species are extremely important and fairly rare within Central Ontario Landscapes	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	ELC Community Classes SW, MA, FE, BO, OA and SA. Typically these wetland ecosites will be isolated (>120m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (e.g. Bull Frog) may be adjacent to woodlands.	• Wetlands >500m^2 (about 25m diameter)[ccvii] supporting high species diversity are significant: some small or ephemeral habitats may not be identified on MNR mapping and could be important amphibian breeding habitats[clxxxiv]. • Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. • Bullfrogs require permanent water bodies with abundant emergent vegetation. <u>Information Sources</u> • Ontario Herpetofaunal Summary Atlas (or other similar atlases) • Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count. • OMNRF Districts and wetland evaluations • Reports and other information available from CAs	Studies confirm: • Presence of breeding population of 1or more of the listed newt/salamander species or 2 or more of the listed frog or toad species and with at least 20 breeding individuals (adults and eggs masses)[lxxi, lxxiii] or 2 or more of the listed frog/toad species with Call Level of 3. or; Wetland with confirmed breeding Bullfrogs are significant[í]. • The ELC ecosite wetland area and the shoreline are the SWH. • A combination of observational study and call count surveys cviii to determine breeding/larval stages will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands. • If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHMIST[cxlix] Index #15 provides development effects and mitigation measures.	Anuran call surveys did not confirm sufficient presence of amphibian breeding habitat.	
Wildlife Habitat: Woodland Area-Sensitive Bird Breeding Habitat					Possible	Not Present
Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest song birds.	Yellow-bellied Sapsucker Red-breasted Nuthatch Veery Blue-headed Vireo Northern Parula Black-throated Green Warbler Blackburnian Warbler Black-throated Blue Warbler Ovenbird Scarlet Tanager Winter Wren Pileated Woodpecker <u>Special Concern</u>: Cerulean Warbler Canada Warbler	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD	• Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs. old) forest stands or woodlots >30ha[cv, cxxxi, cxxxii, cxxxiii, cxxxiv, cxxxv, cxxxvi, cxxxvii, cxxxviii, cxxxix, cxl, cxli, cxlii, cxliii, cxliv, cxlv, cxlvi, cl, cli, clii, cliii, cliv, clv, clvi, clvii, clviii, clix]. • Interior forest habitat is at least 200m from forest edge habitat[clxiv]. <u>Information Sources</u> • Local birder clubs • Canadian Wildlife Service (CWS) for the location of forest bird monitoring • Bird Studies Canada conducted a 3-year study of 287 woodlands to determine the effects of forest fragmentation on forest birds and to determine what forests were of greatest value to interior species. • Reports and other information available from CAs	Studies confirm: • Presence of nesting or breeding pairs of 3 or more of the listed wildlife species[í]. • Note: any site with breeding Cerulean Warblers or Canada Warbler is to be considered SWH[í]. • Conduct field investigations in early summer when birds are singing and defending their territories. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMIST[cxlix] Index #34 provides development effects and mitigation measures.	Suitable breeding evidence for the listed species was not observed during breeding bird surveys.	

Significant Wildlife Habitat Assessment Tables

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 7E (MNRF 2015)

	Candidate SWH			Confirmed SWH	Assessment Details	
Rationale	**Wildlife Species**	**ELC Ecosite Codes**	**Habitat Criteria and Information Sources**	**Defining Criteria**	**Study Area**	**Subject Property**
Wildlife Habitat: Marsh Bird Breeding Habitat					Not Present	Not Present
Wetlands for these bird species are typically productive and fairly rare in Southern Ontario landscapes.	American Bittern Virginia Rail Sora Common Gallinule American Coot Pied-billed Grebe Marsh Wren Sedge Wren Common Loon Green Heron Trumpeter Swan <u>Special Concern</u>: Black Tern Yellow Rail	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SAS1 SAM1 SAF1 FEO1 BOO1 For Green Heron: All SW, MA and CUM1 sites	• Nesting occurs in wetlands • All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present[cxxiv]. • For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water. <u>Information Sources</u> • OMNRF Districts and wetland evaluations • Field naturalist clubs • Natural Heritage Information Centre (NHIC) • Reports and other information available from CAs • Ontario Breeding Bird Atlas[ccv]	Studies confirm: • Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or breeding by any combination of 4 or more of the listed species[i]. • Note: any wetland with breeding of 1 or more Trumpeter Swans, Black Terns, Green Heron or Yellow Rail is SWH[i]. • Area of the ELC ecosite is the SWH • Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”[ccxi] • SWHMIST[cxlix] Index #35 provides development effects and mitigation measures	Breeding bird surveys were completed and did document the defining criteria. A Green Heron was observed within a golf course pond, but breeding evidence was not confirmed.	
Wildlife Habitat: Open Country Bird Breeding Habitat					Not Present	Not Present
This wildlife habitat is declining throughout Ontario and North America. Species such as the Upland Sandpiper have declined significantly the past 40 years based on CWS (2004) trend records.	Upland Sandpiper Grasshopper Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow <u>Special Concern</u>: Short-eared Owl	CUM1 CUM2	Large grassland areas (includes natural and cultural fields and meadows) >30ha[clx, clxi, clxii, clxiii, clxiv, clxv, clxvi, clxvii, clxviii, clxix]. Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e. no row cropping or intensive hay or livestock pasturing in the last 5 years)[i]. Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older. The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species. <u>Information Sources</u> • Agricultural land classification maps Ministry of Agriculture • Local birder clubs • Ontario Breeding Bird Atlas[ccv] • EIS Reports and other information available from CAs	Field Studies confirm: • Presence of nesting or breeding of 2 or more of the listed species[i]. • A field with 1 or more breeding Short-eared Owls is to be considered SWH. • The area of SWH is the contiguous ELC ecosite field areas. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”[ccxi] • SWHMIST[cxlix] Index #32 provides development effects and mitigation measures	The subject property and study area lack grassland habitat of a suitable size. Agricultural fields within the study area are active and unsuitable.	

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 7E (MNRF 2015)

	Candidate SWH			Confirmed SWH	Assessment Details	
Rationale	**Wildlife Species**	**ELC Ecosite Codes**	**Habitat Criteria and Information Sources**	**Defining Criteria**	**Study Area**	**Subject Property**
Wildlife Habitat: Shrub/Early Successional Bird Breeding Habitat					Not Present	Not Present
This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined significantly over the past 40 years based on CWS (2004) trend records.	Indicator Spp: Brown Thrasher Clay-coloured Sparrow Common Spp. Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher <u>Special Concern</u>: Yellow-breasted Chat Golden-winged Warbler	CUT1 CUT2 CUS1 CUS2 CUW1 CUW2 Patches of shrub ecosites can be complexed into a larger habitat such as woodland area for some bird species.	Large natural field areas succeeding to shrub and thicket habitats >10ha[clxiv] in size. Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (i.e. no row-cropping, haying or live-stock pasturing in the last 5 years)[í]. Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species[clxxiii]. Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands. <u>Information Sources</u> • Agricultural land classification maps, Ministry of Agriculture. • Local bird clubs • Ontario Breeding Bird Atlas[ccv] • Reports and other information available from CAs	Field Studies confirm: • Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species[í]. • A field with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat[í]. • The area of the SWH is the contiguous ELC ecosite field/thicket area. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”[ccxi] • SWHMIST[cxlix] Index #33 provides development effects and mitigation measures.	The subject property and study area do not contain shrub and thicket habitat >10ha. Agricultural fields within the study area are active and unsuitable.	
Wildlife Habitat: Terrestrial Crayfish					Possible	Not Present
Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats are very rare. [Ccii]	Chimney or Digger Crayfish (*Fallicambarus fodiens*) Devil Crawfish or Meadow Crayfish (*Cambarus Diogenes*)	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 MAS1 MAS2 MAS3 SWD SWT SWM CUM1 with inclusions of above meadow marsh ecosites can be used by terrestrial crayfish.	Wet meadow and edges of shallow marshes (no minimum size) identified should be surveyed for terrestrial crayfish. • Constructs burrows in marshes, mudflats, meadows, the ground can’t be too moist. Can often be found far from water. • Both species are a semi-terrestrial burrower which spends most of its life within burrows consisting of a network of tunnels. Usually the soil is not too moist so that the tunnel is well formed. <u>Information Sources</u> • Information sources from “Conservation Status of Freshwater Crayfishes” by Dr. Premek Hamr for the WWF and CNF March 1998.	Studies Confirm: • Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable marsh meadow or terrestrial sites[cci]. • Area of ELC Ecosite or an ecoelement area of meadow marsh or swamp within the large ecosite area is the SWH • Surveys should be done April to August in temporary or permanent water. Note the presence of burrows or chimneys are often the only indicator of presence, observance or collection of individuals is very difficult [cci] • SWHMIST[cxlix] Index #36 provides development effects and mitigation measures.	The SWT2-2 wetland within the subject property had the potential to provide suitable habitat, but no chimneys were observed during the field program. Some wetlands are present with some distance to the subject property tha tmay provide suitable habitat, but would not be affected by the proposed development.	

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 7E (MNRF 2015)

	Candidate SWH			Confirmed SWH	Assessment Details	
Rationale	**Wildlife Species**	**ELC Ecosite Codes**	**Habitat Criteria and Information Sources**	**Defining Criteria**	**Study Area**	**Subject Property**
Wildlife Habitat: Special Concern and Rare Wildlife Species					Candidate	Confirmed
These species are quite rare or have experienced significant population declines in Ontario	All Special Concern and Provincially Rare (S1-S3, SH) plant and animal species. Lists of these species are tracked by the Natural Heritage Information Centre (NHIC).	All plant and animal element occurrences (EO) within a 1 or 10km grid. Older element occurrences were recorded prior to GPS being available, therefore location information may lack accuracy.	When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or provincially Rare species; linking candidate habitat on the site needs to be completed to ELC Ecosites[lxxviii]. <u>Information Sources</u> • Natural Heritage Information Centre (NHIC) will have the Special Concern and Provincially Rare (S1-S3, SH) species lists and element occurrences for these species. • NHIC Website: "Get Information" http://nhic.mnr.gov.on.ca • Ontario Breeding Bird Atlas[ccv] • Expert advice should be sought as many of the rare spp. have little information available about their requirements.	Studies Confirm: • Assessment/inventory of the site for the identified special concern or rare species needs to be completed during the time of year when the species is present or easily identifiable. • The area of the habitat to the finest ELC scale that protects the habitat form and function is the SWH, this must be delineated through detailed field studies. The habitat needs to be easily mapped and cover an important life stage component for a species e.g. specific nesting habitat or foraging habitat. • SWHMIST[cxlix] Index #37 provides development effects and mitigation measures.	Snapping Turtle habitat is confirmed in the SWT2-2 wetland. Candidate habitat for Tufted Titmouse, Eastern Wood-pewee, Barn Swallow, Purple Martin, and Monarch is present within the subject property. Candidate habitat for Wood Thrush, Bank Swallow, and Red-headed Woodpecker is present within the study area.	

Significant Wildlife Habitat Assessment Tables

Table 5. Characteristics of Animal Movement Corridors for Ecoregion 7E (MNRF 2015)

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Amphibian Movement Corridors					Possible	Possible
Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.	Eastern Newt American Toad Blue-spotted Salamander Spotted Salamander Four-toed Salamander Gray Treefrog Northern Leopard Frog Pickerel Frog Western Chorus Frog	Corridors may be found in all ecosites associated with water. • Corridors will be determined based on identifying the significant breeding habitat for these species in Table 1.1.	Movement corridors between breeding habitat and summer habitat[clxxiv, clxxv, clxxvi, clxxvii, clxxviii, clxxix, clxxx, clxxxi] Movement corridors must be considered when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2 (Amphibian Breeding Habitat – Wetland) of this Schedule[í]. <u>Information Sources</u> • MNRF District Office • Natural Heritage Information Centre NHIC • Reports and other information available from CAs • Field naturalist Clubs	• Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites. • Corridors should consist of native vegetation, with several layers of vegetation. Corridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant[cxlix]. • Corridors should have at least 15m of vegetation on both sides of waterwaycxlix or be up to 200m widecxlix of woodland habitat and with gaps <20m[cxlix] • Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat[cxlix]. • SWHMIST[cxlix] Index #40 provides development effects and mitigation measures.	Suitbale breeding habitat was not documented through anuran call surveys, and suitable salamander habitat is not present on the eastern portion of the subject property or study area, but there is potential for salamander movement between FOD features in the protected western areas of the subject property.	

Significant Wildlife Habitat Assessment Tables

Table 6. Exceptions for Ecodistricts within Ecoregion 7E-2 (MNRF 2015)

	Candidate SWH			Confirmed SWH	Assessment Details	
Rationale	**Wildlife Species**	**Ecosites**	**Habitat Criteria and Information Sources**	**Defining Criteria**	**Study Area**	**Subject Property**
Bat Migratory Stopover Area					Not Present	Not Present
Stopover areas for long distance migrant bats are important during fall migration.	Hoary Bat Eastern Red Bat Silver-haired Bat	No specific ELC types	• Long distance migratory bats typically migrate during late summer and early fall migrating summer breeding habitats throughout Ontario to southern wintering areas. Their annual fall migration may concentrate these species of bats at stopover areas. • This is the only known bat migratory stopover habitats based on current information. <u>Information Sources</u> • OMNRF for possible locations and contact for local experts • University of Waterloo, Biology Department	• Long Point (42°35'N, 80°30'E, to 42°33'N, 80°03'E) has been identified as a significant stop-over habitat for fall migrating Silver-haired bats, due to significant increases in abundance, activity and feeding that was documented during fall migration[ccxv]. • The confirmation criteria and habitat areas for this SWH are still being determined. • SWHMIST[cxlix] Index #38 provides development effects and mitigation measures	This subject property and study area occur outside of the known stopover habitat for bats.	

Appendix V
Vascular Flora Species Reported from the Study Area

Plant Species Reported from the Study Area - Kettle Creek Golf Coursea, Port Stanley

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Elgin	NHIC Data*	NRSI Observed	NRSI Observed	NRSI Tree Inventory Data	FOD5-2	CUP3-2	CUM1	CUT1-5	FOD 7	MAS2	CUM1-1	CUT1-1	Hedgerow	SWD	CUW1	FOD5-2
		MNRF 2023a	MECP 2023	Government of Canada 2023	Government of Canada 2023	Government of Canada 2023	Oldham 2017	MNRF 2023b	NRSI Results From 2022-2023														
Pteridophytes	**Ferns & Allies**																						
Dryopteridaceae	**Wood Fern Family**																						
Dryopteris carthusiana	Spinulose Wood Fern	S5					C		X				X	X									
Matteuccia struthiopteris	Ostrich Fern	S5					C		X				X		X	X							
Onoclea sensibilis	Sensitive Fern	S5					C		X			X	X										
Equisetaceae	**Horsetail Family**																						
Equisetum arvense	Field Horsetail	S5					C		X			X					X	X					X
Thelypteridaceae	**Beech Fern Family**																						
Phegopteris hexagonoptera	Broad Beech Fern	S3	SC	SC	SC	Schedule 3	U	X															
Gymnosperms	**Conifers**																						
Cupressaceae	**Cypress Family**																						
Thuja occidentalis	Eastern White Cedar	S5					C		X		X								X				
Ginkgoaceae	**Ginkgo Family**																						
Ginkgo biloba	Maiden-hair Tree								X		X												
Pinaceae	**Pine Family**																						
Abies balsamea	Balsam Fir	S5					IR		X		X												
Picea abies	Norway Spruce	SE3							X		X		X			X		X	X				
Picea glauca	White Spruce	S5							X		X	X						X	X				X
Picea pungens	Blue Spruce	SE1							X		X												
Pinus nigra	Black Pine	SE3							X		X												
Pinus resinosa	Red Pine	S5							X		X												
Pinus strobus	Eastern White Pine	S5					U		X		X	X	X						X	X			X
Dicotyledons	**Dicots**																						
Aceraceae	**Maple Family**																						
Acer ginnala	Amur Maple	SE1							X		X												
Acer japonicum	Japanese Maple								X		X												
Acer negundo	Manitoba Maple	S5					C		X		X	X					X	X		X		X	X
Acer platanoides	Norway Maple	SE5					IR		X		X		X					X					
Acer pseudoplatanus	Sycamore Maple	SE1							X		X												
Acer rubrum	Red Maple	S5					C		X		X												
Acer saccharum	Sugar Maple	S5					C		X		X	X			X	X							
Acer x freemanii	Freeman's Maple	SNA							X		X												
Anacardiaceae	**Sumac or Cashew Family**																						
Rhus typhina	Staghorn Sumac	S5					C		X	X		X	X		X		X	X		X			X
Toxicodendron radicans	Poison Ivy	S5							X				X										
Toxicodendron radicans var. radicans	Eastern Poison Ivy	S5					X		X				X										
Toxicodendron radicans var. rydbergii	Western Poison Ivy	S5					X		X				X			X		X					
Apiaceae	**Carrot or Parsley Family**																						
Daucus carota	Wild Carrot	SE5					IC		X	X								X			X		
Heracleum mantegazzianum	Giant Hogweed	SE2							X									X					
Sanicula marilandica	Maryland Sanicle	S5					X		X			X											
Araliaceae	**Ginseng Family**																						
Panax quinquefolius	American Ginseng	S2	END	E	E	Schedule 1	R	X															
Asclepiadaceae	**Milkweed Family**																						
Asclepias syriaca	Common Milkweed	S5					C		X									X					
Asteraceae	**Composite or Aster Family**																						
Ambrosia artemisiifolia	Common Ragweed	S5					C		X											X			
Ambrosia trifida	Great Ragweed	S5					C		X										X		X		
Arctium minus	Common Burdock	SE5					IC		X				X	X	X	X		X	X	x	X		
Carduinae	Unspecified Thistle								X									X	X				
Cirsium arvense	Creeping Thistle	SE5					IC		X								X	X		X			
Erigeron annuus	Annual Fleabane	S5					C		X										X		X		
Erigeron philadelphicus	Philadelphia Fleabane	S5					C		X									X					
Eupatorium perfoliatum	Common Boneset	S5					C		X						X								
Euthamia graminifolia	Grass-leaved Goldenrod	S5					C		X						X			X					
Eutrochium maculatum	Spotted Joe Pye Weed	S5							X	X			X										
Solidago altissima	Tall Goldenrod	S5							X									X					
Solidago caesia	Blue-stemmed Goldenrod	S5					X		X			X											
Solidago canadensis	Canada Goldenrod	S5							X			X	X	X	X		X	X	X				
Solidago juncea	Early Goldenrod	S5					X		X										X				
Solidago sp.	Unspecified Goldenrod								X	X						X		X		X			
Sonchus arvensis	Field Sow-thistle	SE5					IX		X						X		X			X			
Symphyotrichum lanceolatum	Panicled Aster	S5					C		X			X			X		X						
Symphyotrichum lateriflorum	Calico Aster	S5					X		X			X	X		X	X							
Symphyotrichum novae-angliae	New England Aster	S5					C		X						X		X	X					
Symphyotrichum urophyllum	Arrow-leaved Aster	S4					X		X			X		X			X	X					X
Taraxacum officinale	Common Dandelion	SE5					IC		X			X	X						X	X			X
Tussilago farfara	Colt's-foot	SE5					IC		X						X		X			X			
Balsaminaceae	**Touch-me-not Family**																						
Impatiens capensis	Spotted Jewelweed	S5					C		X			X			X	X	X	X			X		X
Berberidaceae	**Barberry Family**																						
Berberis thunbergii	Japanese Barberry	SE5					IU		X				X										
Berberis sp.	Unspecified Barberry								X				X										
Podophyllum peltatum	May-apple	S5					C		X			X			X	X							X
Betulaceae	**Birch Family**																						

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Elgin	NHIC Data*	NRSI Observed	NRSI Observed	NRSI Tree Inventory Data	FOD5-2	CUP3-2	CUM1	CUT1-5	FOD 7	MAS2	CUM1-1	CUT1-1	Hedgerow	SWD	CUW1	FOD5-2
Betula alleghaniensis	Yellow Birch	S5					C		X			X			X								
Ostrya virginiana	Eastern Hop-hornbeam	S5					C		X			X											
Boraginaceae	**Borage Family**																						
Hackelia virginiana	Virginia Stickseed	S5					X		X			X	X										
Brassicaceae	**Mustard Family**																						
Alliaria petiolata	Garlic Mustard	SE5					IC		X			X	X	X	X	X	X	X	X	X	X		X
Barbarea vulgaris	Bitter Wintercress	SE5					IC		X									X	X		X		
Cardamine pensylvanica	Pennsylvania Bittercress	S5					X		X			X											X
Hesperis matronalis	Dame's Rocket	SE5					IC		X			X	X		X		X	X		X	X		
Cactaceae	**Cactus Family**																						
Opuntia cespitosa	Eastern Prickly-pear Cactus	S1	END	E	E	Schedule 1	?	X															
Caprifoliaceae	**Honeysuckle Family**																						
Sambucus canadensis	Common Elderberry	S5					X		X			X	X		X		X						X
Sambucus racemosa	Red Elderberry	S5					X		X				X										
Viburnum opulus	Cranberry Viburnum	S5							X				X	X						X	X		
Convolvulaceae	**Morning-glory Family**																						
Calystegia sepium	Hedge False Bindweed	S5					X		X											X	X		
Cornaceae	**Dogwood Family**																						
Cornus alternifolia	Alternate-leaved Dogwood	S5					X		X			X	X		X			X		X			X
Cornus drummondii	Rough-leaved Dogwood	S4					U		X					X									
Cornus obliqua	Pale Dogwood	S5					X		X			X		X	X								
Cornus racemosa	Gray Dogwood	S5					X		X			X					X			X			X
Cornus sericea	Red-osier Dogwood	S5					C		X			X	X		X	X	X				X		X
Cucurbitaceae	**Gourd Family**																						
Echinocystis lobata	Wild Mock-cucumber	S5					X		X				X										
Sicyos angulatus	One-seeded Bur-cucumber	S4S5					X		X			X											
Elaeagnaceae	**Oleaster Family**																						
Elaeagnus umbellata	Autumn Olive	SE3					IR		X					X								X	
Fabaceae	**Pea Family**																						
Gleditsia triacanthos	Honey-locust	S2?					IX		X									X		X			
Trifolium pratense	Red Clover	SE5					IX		X										X				
Vicia caroliniana	Carolina Vetch	S2?					R	X															
Fagaceae	**Beech Family**																						
Fagus grandifolia	American Beech	S4					C		X		X	X	X		X								
Quercus alba	White Oak	S5					C		X		X												
Quercus robur	English Oak	SE1							X		X												
Quercus rubra	Northern Red Oak	S5					C		X		X												
Gentianaceae	**Gentian Family**																						
Gentianella quinquefolia	Stiff Gentian	S2					R	X															
Geraniaceae	**Geranium Family**																						
Geranium maculatum	Spotted Geranium	S5					C		X							X							
Grossulariaceae	**Currant Family**																						
Ribes americanum	Wild Black Currant	S5					C		X			X	X										X
Ribes cynosbati	Prickly Gooseberry	S5					C		X			X	X										
Ribes rubrum	Northern Red Currant	SE5					IR		X			X											
Hydrophyllaceae	**Water-leaf Family**																						
Hydrophyllum virginianum	Virginia Waterleaf	S5					C		X				X										
Juglandaceae	**Walnut Family**																						
Carya cordiformis	Bitternut Hickory	S5					C		X				X	X									
Carya ovata	Shagbark Hickory	S5					C		X			X											
Juglans cinerea	Butternut	S2?	END	E	E	Schedule 1	U	X															
Juglans nigra	Black Walnut	S4?					C		X	X	X	X	X	X	X	X				X	X		
Lamiaceae	**Mint Family**																						
Glechoma hederacea	Ground Ivy	SE5					IX		X			X	X			X		X	X	X			X
Leonurus cardiaca	Common Motherwort	SE5					IC		X										X				
Monarda fistulosa	Wild Bergamot	S5					C		X												X		
Nepeta cataria	Catnip	SE5					IC		X										X				
Prunella vulgaris	Self-heal	S5							X														X
Lythraceae	**Loosestrife Family**																						
Lythrum salicaria	Purple Loosestrife	SE5					IC		X									X					
Moraceae	**Mulberry Family**																						
Morus alba	White Mulberry	SE5					IU		X		X												
Oleaceae	**Olive Family**																						
Fraxinus americana	White Ash	S4					C		X		X	X	X	X	X	X		X					
Fraxinus pennsylvanica	Green Ash	S4					C		X		X	X	X			X							X
Ligustrum vulgare	European Privet	SE5					IR		X			X	X	X		X		X					
Onagraceae	**Evening-primrose Family**																						
Circaea canadensis	Broad-leaved Enchanter's Nightshade	S5					C		X			X	X		X	X							X
Oxalidaceae	**Wood Sorrel Family**																						
Oxalis stricta	Upright Yellow Wood-sorrel	SE5					X		X			X											
Plantaginaceae	**Plantain Family**																						
Plantago major	Common Plantain	SE5					IC		X							X							
Platanaceae	**Plane-tree Family**																						
Platanus × hispanica	London Plane-tree	SE1							X		X												
Polygonaceae	**Smartweed Family**																						
Fallopia dumetorum	Hedge Bindweed	SEH							X									X					
Persicaria maculosa	Spotted Lady's-thumb	SE5					IC		X									X					
Persicaria virginiana	Virginia Smartweed	S4					R		X			X	X			X				X			
Polygonum erectum	Erect Knotweed	SH					H	X															

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Elgin	NHIC Data*	NRSI Observed	NRSI Observed	NRSI Tree Inventory Data	FOD5-2	CUP3-2	CUM1	CUT1-5	FOD 7	MAS2	CUM1-1	CUT1-1	Hedgerow	SWD	CUW1	FOD5-2
Rumex britannica	Water Dock	S5					X		X				X										
Rumex crispus	Curly Dock	SE5					IC		X				X					X					
Rumex obtusifolius	Bitter Dock	SE5					IX		X			X			X								
Primulaceae	**Primrose Family**																						
Lysimachia nummularia	Creeping Jennie	SE5					IX		X			X	X										
Ranunculaceae	**Buttercup Family**																						
Anemone virginiana	Tall Anemone	S5					C		X											X			
Enemion biternatum	Eastern False Rue-anemone	S2	THR	T	T	Schedule 1	R	X															
Ranunculus recurvatus	Hooked Buttercup	S5					X		X									X					X
Ranunculus recurvatus var. recurvatus	Hooked Buttercup	S5							X			X											
Ranunculus repens	Creeping Buttercup	SE5					IR		X												X		
Rhamnaceae	**Buckthorn Family**																						
Rhamnus cathartica	Common Buckthorn	SE5					IC		X			X	X		X	X		X		X			X
Rosaceae	**Rose Family**																						
Crataegus sp.	Hawthorn sp.								X		X		X										
Geum aleppicum	Yellow Avens	S5					X		X			X											
Geum macrophyllum	Large-leaved Avens	S5					?		X			X	X	X									
Geum urbanum	Wood Avens	SE3					IR		X			X			X	X				X	X		
Geum x catlingii	*(Geum canadense X Geum urbanum)*	SNA							X			X				X							
Geum sp.	Unspecified Avens								X							X		X	X	X			
Malus coronaria	Sweet Crabapple	S4					X		X		X												
Malus pumila	Common Apple	SE4					IX		X		X	X	X	X						X		X	X
Prunus avium	Sweet Cherry	SE4					IR		X		X	X	X										
Prunus serotina	Black Cherry	S5					C		X		X	X	X										
Prunus virginiana	Choke Cherry	S5					C		X			X	X		X	X							X
Pyrus calleryana	Chanticleer Pear								X		X												
Pyrus communis	Common Pear	SE4					IX		X		X		X							X			
Rosa multiflora	Multiflora Rose	SE5					IX		X			X	X	X	X	X	X	X		X			X
Rubus allegheniensis	Allegheny Blackberry	S5					C		X			X											X
Rubus idaeus	Common Red Raspberry	S5							X			X	X		X	X		X		X	X		X
Rubus odoratus	Purple-flowering Raspberry	S5					X		X			X	X		X								X
Sorbus aucuparia	European Mountain-ash	SE4					IX		X		X												
Rutaceae	**Rue Family**																						
Ptelea trifoliata	Common Hop-tree	S3	SC	SC	SC	Schedule 1	R	X															
Salicaceae	**Willow Family**																						
Populus deltoides	Eastern Cottonwood	S5					C		X		X	X	X					X		X			X
Populus grandidentata	Large-toothed Aspen	S5					C		X		X						X						
Populus tremuloides	Trembling Aspen	S5					C		X		X			X						X		X	
Salix alba	White Willow	SE4					IX		X								X				X		
Salix babylonica	Weeping Willow	SNA																					
Salix euxina	Crack Willow	SE					IX		X								X				X		
Salix interior	Sandbar Willow	S5					C		X								X						
Salix nigra	Black Willow	S4					X		X									X					
Salix x pendulina	*(Salix babylonica X Salix euxina)*	SNA							X			X								X			
Salix sp.	Unspecified Willow								X	X							X	X		X			
Scrophulariaceae	**Figwort Family**																						
Verbascum thapsus	Common Mullein	SE5					IC		X	X								X					
Solanaceae	**Nightshade Family**																						
Solanum dulcamara	Bittersweet Nightshade	SE5					IC		X			X	X		X	X		X					
Solanum emulans	Eastern Black Nightshade	S5							X			X	X					X					X
Tiliaceae	**Linden Family**																						
Tilia americana	American Basswood	S5					C		X		X				X	X		X					
Tilia cordata	Little-leaf Linden	SE1							X		X												
Ulmaceae	**Elm Family**																						
Celtis occidentalis	Common Hackberry	S4					C		X		X												
Ulmus americana	American Elm	S5					C		X		X		X										
Zelkova serrata	Japanese Zelkova								X		X												
Urticaceae	**Nettle Family**																						
Urtica dioica	Stinging Nettle	SE2							X			X	X				X	X	X				X
Verbenaceae	**Vervain Family**																						
Verbena urticifolia	White Vervain	S5					X		X			X											
Violaceae	**Violet Family**																						
Viola sororia	Woolly Blue Violet	S5					C		X			X	X										X
Vitaceae	**Grape Family**																						
Parthenocissus quinquefolia	Virginia Creeper	S4?					X		X			X		X	X	X		X		X			X
Parthenocissus vitacea	Thicket Creeper	S5					C		X			X	X	X	X				X				
Vitis riparia	Riverbank Grape	S5					C		X	X		X	X	X	X			X		X			
Monocotyledons	**Monocots**																						
Araceae	**Arum Family**																						
Arisaema triphyllum	Jack-in-the-pulpit	S5					C		X			X	X		X	X							X
Symplocarpus foetidus	Skunk Cabbage	S5					C		X	X		X	X		X	X		X			X		X
Cyperaceae	**Sedge Family**																						
Carex blanda	Woodland Sedge	S5					C		X									X					
Cyperus esculentus	Perennial Yellow Flatsedge	S5					C		X									X					
Juncaceae	**Rush Family**																						
Juncus acuminatus	Sharp-fruited Rush	S3					R	X															
Liliaceae	**Lily Family**																						
Erythronium albidum	White Trout-lily	S4					U		X				X		X								
Maianthemum stellatum	Star-flowered False Solomon's Seal	S5					C		X				X								X		

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Elgin	NHIC Data*	NRSI Observed	NRSI Observed	NRSI Tree Inventory Data	FOD5-2	CUP3-2	CUM1	CUT1-5	FOD 7	MAS2	CUM1-1	CUT1-1	Hedgerow	SWD	CUW1	FOD5-2
Maianthemum sp.	*Unspecified Maianthemum sp.*								X				X										
Orchidaceae	**Orchid Family**																						
Epipactis helleborine	Eastern Helleborine	SE5					IU		X			X											
Poaceae	**Grass Family**																						
Bromus inermis	Smooth Brome	SE5					IC		X						X								
Dactylis glomerata	Orchard Grass	SE5					IC		X				X	X						X			
Echinochloa crus-galli	Large Barnyard Grass	SE5					IC		X						X								
Elymus virginicus	Virginia Wildrye	S5							X			X											
Phalaris arundinacea	Reed Canary Grass	S5					C		X								X	X					
Phragmites australis	Common Reed	SU							X			X					X		X				
Poa pratensis	Kentucky Bluegrass	S5							X							X			X	X	X		
Vulpia octoflora	Eight-flowered Fescue	S1S2					H	X															
Typhaceae	**Cattail Family**																						
Typha angustifolia	Narrow-leaved Cattail	SE5					IC		X								X						
Typha latifolia	Broad-leaved Cattail	S5					C		X								X						
Typha sp.	Unspecified Cattail								X			X								X			
TOTAL								**11**	**172**	**9**	**33**	**73**	**66**	**21**	**42**	**33**	**27**	**52**	**22**	**37**	**21**	**4**	**36**

*NHIC Atlas Squares: 17MH8124, 17MH8123, 17MH8223, 17MH8224, 17MH8024, 17MH8023

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Appendix VI
Bird Species Reported from the Study Area

Bird Species Reported from the Study Area - Kettle Creek Golf Course, Port Stanley

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	OBBA*	NHIC Data**	NRSI Observed: Highest Level of Breeding Evidence	BMB-001	BMB-002	BMB-003	BMB-004	BMB-005	BMB-006	General Bird Area Search	Incidentals
		MNRF 2023a	MECP 2024	Government of Canada 2023	Government of Canada 2023	Government of Canada 2023	BSC et al. 2006	MNRF 2023b	NRSI Results from 2023								
Anatidae	**Ducks, Geese & Swans**																
Aix sponsa	Wood Duck	S5B,S3N					CO										
Anas platyrhynchos	Mallard	S5					CO		**PO**					PO			X
Anas rubripes	American Black Duck	S4					CO										
Aythya valisineria	Canvasback	S1B,S3N,S4M						X									
Branta canadensis	Canada Goose	S5					CO		**PR**				PR		PO		X
Lophodytes cucullatus	Hooded Merganser	S5					PR										
Oxyura jamaicensis	Ruddy Duck	S3B,S4N,S5M					CO	X									
Spatula discors	Blue-winged Teal	S3B,S4M					CO										
Odontophoridae	**New World Quails**																
Colinus virginianus	Northern Bobwhite	S1?	END	E	E	Schedule 1	PR	X									
Phasianidae	**Partridges, Grouse & Turkeys**																
Bonasa umbellus	Ruffed Grouse	S5					PR										
Meleagris gallopavo	Wild Turkey	S5					CO		**PO**							PO	
Columbidae	**Pigeons & Doves**																
Columba livia	Rock Pigeon	SNA					CO										
Zenaida macroura	Mourning Dove	S5					CO		**PO**					PO			
Cuculiformes	**Cuckoos & Anis**																
Coccyzus americanus	Yellow-billed Cuckoo	S4B					PR										
Coccyzus erythropthalmus	Black-billed Cuckoo	S4S5B					CO										
Apodidae	**Swifts**																
Chaetura pelagica	Chimney Swift	S3B	THR	T	T	Schedule 1	PR										
Trochilidae	**Hummingbirds**																
Archilochus colubris	Ruby-throated Hummingbird	S5B					CO										
Rallidae	**Rails, Gallinules & Coots**																
Gallinula galeata	Common Gallinule	S3B						X									
Porzana carolina	Sora	S5B					PO										
Rallus limicola	Virginia Rail	S4S5B					PR										
Charadriidae	**Plovers & Lapwings**																
Charadrius vociferus	Killdeer	S4B					CO		**PR**				PR	PR			X
Scolopacidae	**Sandpipers & Allies**																
Actitis macularius	Spotted Sandpiper	S5B	0	0	0	0	CO										
Scolopax minor	American Woodcock	S4B					CO										
Ardeidae	**Herons & Bitterns**																
Ardea herodias	Great Blue Heron	S4					PO										
Butorides virescens	Green Heron	S4B					CO										X
Cathartidae	**Vultures**																
Cathartes aura	Turkey Vulture	S5B,S3N					PO		**PO**				OB	PO	OB		X
Pandionidae	**Osprey**																
Pandion haliaetus	Osprey	S5B							**PO**						PO		
Accipitridae	**Hawks, Kites, Eagles & Allies**																
Accipiter cooperii	Cooper's Hawk	S4	NAR	NAR	NS	No schedule	PR										
Accipiter striatus	Sharp-shinned Hawk	S5	NAR	NAR	NS	No schedule	PR										
Buteo jamaicensis	Red-tailed Hawk	S5	NAR	NAR	NS	No schedule	CO										
Circus hudsonius	Northern Harrier	S5B,S4N	NAR	NAR	NS	No schedule	CO										
Haliaeetus leucocephalus	Bald Eagle	S4	SC	NAR	NS	No schedule		X									
Strigidae	**Typical Owls**																
Bubo virginianus	Great Horned Owl	S4					CO										
Megascops asio	Eastern Screech-Owl	S4	NAR	NAR	NS	No schedule	CO										
Alcedinidae	**Kingfishers**																
Megaceryle alcyon	Belted Kingfisher	S5B,S4N					CO										X
Picidae	**Woodpeckers**																
Colaptes auratus	Northern Flicker	S5					CO										X
Dryobates pubescens	Downy Woodpecker	S5					CO		**PO**	PO	PO	PO			PO	PO	X

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	OBBA*	NHIC Data**	NRSI Observed: Highest Level of Breeding Evidence	BMB-001	BMB-002	BMB-003	BMB-004	BMB-005	BMB-006	General Bird Area Search	Incidentals
Dryobates villosus	Hairy Woodpecker	S5					CO										
Dryocopus pileatus	Pileated Woodpecker	S5					CO										
Melanerpes carolinus	Red-bellied Woodpecker	S5					CO		**PO**							PO	
Melanerpes erythrocephalus	Red-headed Woodpecker	S3	END	E	E	Schedule 1	CO	X									X
Sphyrapicus varius	Yellow-bellied Sapsucker	S5B,S3N					CO										
Falconidae	**Caracaras & Falcons**																
Falco sparverius	American Kestrel	S4					CO										
Tyrannidae	**Tyrant Flycatchers**																
Contopus virens	Eastern Wood-Pewee	S4B	SC	SC	SC	Schedule 1	PR	X	**PR**		PR					PO	X
Empidonax minimus	Least Flycatcher	S5B					PR										
Empidonax traillii	Willow Flycatcher	S4B					CO		**PO**					PO			
Empidonax virescens	Acadian Flycatcher	S1B	END	E	E	Schedule 1	CO	X									
Myiarchus crinitus	Great Crested Flycatcher	S5B					CO		**PR**		PR		PO				X
Sayornis phoebe	Eastern Phoebe	S5B					CO										
Tyrannus tyrannus	Eastern Kingbird	S4B					CO		**PO**						PO		
Vireonidae	**Vireos**																
Vireo flavifrons	Yellow-throated Vireo	S4B					CO										
Vireo gilvus	Warbling Vireo	S5B					CO		**PO**					PO			
Vireo olivaceus	Red-eyed Vireo	S5B					CO		**PO**		PO	PO					
Corvidae	**Crows & Jays**																
Corvus brachyrhynchos	American Crow	S5					CO		**CO**	PO	PO	CO	PO				X
Cyanocitta cristata	Blue Jay	S5					CO		**PO**		PO		PO				
Alaudidae	**Larks**																
Eremophila alpestris	Horned Lark	S4					CO										
Hirundinidae	**Swallows**																
Hirundo rustica	Barn Swallow	S4B	SC	SC	T	Schedule 1	CO	X	**PR**	PO					PR	PR	X
Petrochelidon pyrrhonota	Cliff Swallow	S4S5B					CO										
Progne subis	Purple Martin	S3B					CO		**OB**			OB					
Riparia riparia	Bank Swallow	S4B	THR	T	T	Schedule 1	CO	X	**OB**					OB			
Stelgidopteryx serripennis	Northern Rough-winged Swallow	S4B					CO										
Tachycineta bicolor	Tree Swallow	S4S5B					CO		**PR**	PR	PO		PO				
Paridae	**Chickadees & Titmice**																
Baeolophus bicolor	Tufted Titmouse	S3					CO	X									X
Poecile atricapillus	Black-capped Chickadee	S5					CO		**PO**	PO			PO				X
Poecile carolinensis	Carolina Chickadee	SNA							**PO**						PO		
Sittidae	**Nuthatches**																
Sitta canadensis	Red-breasted Nuthatch	S5					PR										
Sitta carolinensis	White-breasted Nuthatch	S5					CO										
Certhiidae	**Creepers**																
Certhia americana	Brown Creeper	S5					PR										
Troglodytidae	**Wrens**																
Thryothorus ludovicianus	Carolina Wren	S4					CO		**PR**	PR	PO	PO	PR		PO		X
Troglodytes aedon	House Wren	S5B					CO		**PR**	PR	PR	PR	PO				X
Troglodytes hiemalis	Winter Wren	S5B,S4N					PR										
Polioptilidae	**Gnatcatchers**																
Polioptila caerulea	Blue-gray Gnatcatcher	S4B					CO										
Turdidae	**Thrushes**																
Catharus fuscescens	Veery	S5B					PR										
Hylocichla mustelina	Wood Thrush	S4B	SC	T	T	Schedule 1	CO	X	**PO**				PO				
Sialia sialis	Eastern Bluebird	S5B,S4N	NAR	NAR	NS	No schedule	CO										
Turdus migratorius	American Robin	S5					CO		**PR**	PR	PR	PR	PO	PR	PR		X
Mimidae	**Mockingbirds, Thrashers & Allies**																
Dumetella carolinensis	Gray Catbird	S5B,S3N					CO		**PR**		PR		PO				X
Mimus polyglottos	Northern Mockingbird	S4					PR										
Toxostoma rufum	Brown Thrasher	S4B					CO										
Sturnidae	**Starlings**																
Sturnus vulgaris	European Starling	SNA					CO		**PO**	PO		PO	PO		PO		
Bombycillidae	**Waxwings**																
Bombycilla cedrorum	Cedar Waxwing	S5					CO		**PR**						PO	PR	
Passeridae	**Old World Sparrows**																

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	OBBA*	NHIC Data**	NRSI Observed: Highest Level of Breeding Evidence	BMB-001	BMB-002	BMB-003	BMB-004	BMB-005	BMB-006	General Bird Area Search	Incidentals
Passer domesticus	House Sparrow	SNA					CO										
Fringillidae	**Finches & Allies**																
Haemorhous mexicanus	House Finch	SNA					CO										
Spinus tristis	American Goldfinch	S5					CO		**PO**	PO	PO		PO		PO		X
Passerellidae	**New World Sparrows & Allies**																
Melospiza georgiana	Swamp Sparrow	S5B,S4N					CO										
Melospiza melodia	Song Sparrow	S5					CO		**PR**	PR			PR	PR			X
Passerculus sandwichensis	Savannah Sparrow	S5B,S3N					CO										
Pipilo erythrophthalmus	Eastern Towhee	S4B,S3N					CO										
Pooecetes gramineus	Vesper Sparrow	S4B					CO										
Spizella passerina	Chipping Sparrow	S5B,S3N					CO		**PR**	PO	PO		PR	PO	PO	PO	X
Spizella pusilla	Field Sparrow	S4B,S3N					CO										
Zonotrichia albicollis	White-throated Sparrow	S5					PO										
Icteridae	**Troupials & Allies**																
Agelaius phoeniceus	Red-winged Blackbird	S5					CO		**CO**	CO			CO	PR			X
Dolichonyx oryzivorus	Bobolink	S4B	THR	SC	T	Schedule 1	CO										
Icterus galbula	Baltimore Oriole	S4B					CO		**PO**			PO	PO	PO			X
Icterus spurius	Orchard Oriole	S4B					CO										
Molothrus ater	Brown-headed Cowbird	S5					CO		**PR**	PO	PO		PO		PR		
Quiscalus quiscula	Common Grackle	S5					CO		**PO**	PO	PO	PO					
Sturnella magna	Eastern Meadowlark	S4B,S3N	THR	T	T	Schedule 1	CO	X									
Parulidae	**Wood Warblers**																
Geothlypis philadelphia	Mourning Warbler	S5B					PR										
Geothlypis trichas	Common Yellowthroat	S5B,S3N					CO		**PO**	PO			PO		PO		X
Mniotilta varia	Black-and-white Warbler	S5B							**PO**							PO	
Parkesia motacilla	Louisiana Waterthrush	S2B	THR	T	T	Schedule 1	CO										
Seiurus aurocapilla	Ovenbird	S5B					PR										
Setophaga magnolia	Magnolia Warbler	S5B							**PO**							PO	
Setophaga pensylvanica	Chestnut-sided Warbler	S5B					PR										
Setophaga petechia	Yellow Warbler	S5B					CO		**PR**	PR	PR	PO	PR	PO	PR		X
Setophaga pinus	Pine Warbler	S5B,S3N					CO		**PO**			PO				PO	
Setophaga ruticilla	American Redstart	S5B					PR										
Vermivora cyanoptera	Blue-winged Warbler	S4B					PR										
Cardinalidae	**Cardinals, Grosbeaks & Allies**																
Cardinalis cardinalis	Northern Cardinal	S5					CO		**PR**	PO	PO	PR		PO	PO		X
Passerina cyanea	Indigo Bunting	S5B					CO		**PR**	PR		PR	PR				X
Pheucticus ludovicianus	Rose-breasted Grosbeak	S5B					CO		**PO**		PO						
Piranga olivacea	Scarlet Tanager	S5B					CO										
Total							**107**	**13**	**45**	**19**	**18**	**14**	**23**	**14**	**17**	**10**	**30**

*OBBA Atlas Square: 17MH82

**NHIC Atlas Squares: 17MH8124, 17MH8123, 17MH8223, 17MH8224, 17MH8024, 17MH8023

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Appendix VII
Herpetofauna Species Reported from the Study Area

Reptile and Amphibian Species Reported from the Study Area - Kettle Creek Golf Course, Port Stanley

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	ORAA*	NHIC Data**	NRSI Observed	Anuran Call Survey	Turtle Basking Survey	Incidentals
		MNRF 2023a	MECP 2022	Government of Canada 2022	Government of Canada 2022	Government of Canada 2022	Ontario Nature 2019	MNRF 2023b	NRSI 2023	NRSI 2023	NRSI 2023	NRSI 2023
Turtles												
Apalone spinifera	Spiny Softshell	S2	END	E	E	Schedule 1		X				
Chelydra serpentina	Snapping Turtle	S4	SC	SC	SC	Schedule 1	X	X	**X**		**X**	
Chrysemys picta marginata	Midland Painted Turtle	S4		SC	SC	Schedule 1	X	X				
Snakes												
Lampropeltis triangulum	Eastern Milksnake	S4	NAR	SC	SC	Schedule 1	X	X				
Nerodia sipedon sipedon	Northern Watersnake	S5	NAR	NAR	NS	No schedule	X					
Sistrurus catenatus pop. 2	Massasauga (Carolinian population)	S1	END	E	E	Schedule 1	X					
Storeria dekayi	Dekay's Brownsnake	S5	NAR	NAR	NS	No schedule	X					
Thamnophis saurita septentrionalis	Northern Ribbonsnake	S4	SC	SC	SC	Schedule 1	X	X				
Thamnophis sirtalis sirtalis	Eastern Gartersnake	S5					X					
Salamanders												
Ambystoma maculatum	Spotted Salamander	S4					X					
Notophthalmus viridescens viridescens	Red-spotted Newt	S5					X					
Plethodon cinereus	Eastern Red-backed Salamander	S5					X					
Frogs and Toads												
Anaxyrus americanus	American Toad	S5					X		**X**			**X**
Dryophytes versicolor	Gray Treefrog	S5					X		**X**			**X**
Pseudacris crucifer	Spring Peeper	S5					X		**X**	**X**		**X**
Lithobates catesbeianus	American Bullfrog	S4					X					
Lithobates clamitans	Green Frog	S5					X		**X**			**X**
Lithobates pipiens	Northern Leopard Frog	S5	NAR	NAR	NS	No schedule	X		**X**			**X**
Lithobates sylvaticus	Wood Frog	S5					X					
Total							**18**	**5**	**6**	**1**	**1**	**5**

*ORAA Atlas Square: 17MH82

**NHIC Atlas Squares: 17MH8124, 17MH8123, 17MH8223, 17MH8224, 17MH8024, 17MH8023

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Appendix VIII
Mammal Species Reported from the Study Area

Mammal Species Reported from the Study Area - Kettle Creek GC, Port Stanley (Project #2982)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Ontario Mammal Atlas	NHIC Data**	Incidentals
		MNRF 2023a	MECP 2024	Government of Canada 2023	Government of Canada 2023	Government of Canada 2023	Dobbyn 1994	MNRF 2023b	NRSI 2022-2023
Didelphimorphia	**Opossums**								
Didelphis virginiana	Virginia Opossum	S4					X		
Eulipotyphla	**Shrews, Moles, Hedgehogs, and Allies**								
Blarina brevicauda	Northern Short-tailed Shrew	S5					X		
Condylura cristata	Star-nosed Mole	S5					X		
Parascalops breweri	Hairy-tailed Mole	S4					X		
Sorex cinereus	Masked Shrew	S5					X		
Sorex fumeus	Smoky Shrew	S5					X		
Sorex hoyi	Pygmy Shrew	S4					X		
Sorex palustris	Water Shrew	S5					X		
Chiroptera	**Bats**								
Eptesicus fuscus	Big Brown Bat	S4					X		
Lasionycteris noctivagans	Silver-haired Bat	S4		E	NS	No Schedule	X		
Lasiurus borealis	Eastern Red Bat	S4		E	NS	No Schedule	X		
Lasiurus cinereus	Hoary Bat	S4		E	NS	No Schedule	X		
Myotis leibii	Eastern Small-footed Myotis	S2S3	END				X		
Myotis septentrionalis	Northern Myotis	S3	END	E	E	Schedule 1	X		
Lagomorpha	**Rabbits and Hares**								
Lepus americanus	Snowshoe Hare	S5					X		
Lepus europaeus	European Hare	SNA					X		
Sylvilagus floridanus	Eastern Cottontail	S5					X		X
Rodentia	**Rodents**								
Castor canadensis	Beaver	S5					X		X
Erethizon dorsatum	Porcupine	S5					X		
Glaucomys volans	Southern Flying Squirrel (Great Lakes Pla	S4	NAR	NAR	NS	No schedule	X		
Marmota monax	Woodchuck	S5					X		X
Microtus pennsylvanicus	Meadow Vole	S5					X		
Microtus pinetorum	Woodland Vole	S3?	SC	SC	SC	Schedule 1	X		
Mus musculus	House Mouse	SNA					X		
Napaeozapus insignis	Woodland Jumping Mouse	S5					X		
Ondatra zibethicus	Muskrat	S5					X		
Peromyscus leucopus	White-footed Mouse	S5					X		
Peromyscus maniculatus	Deer Mouse	S5					X		
Rattus norvegicus	Norway Rat	SNA					X		
Sciurus carolinensis	Eastern Gray Squirrel	S5					X		X
Synaptomys cooperi	Southern Bog Lemming	S4					X		
Tamias striatus	Eastern Chipmunk	S5					X		X
Tamiasciurus hudsonicus	Red Squirrel	S5					X		X
Zapus hudsonius	Meadow Jumping Mouse	S5					X		
Canidae	**Canines**								
Canis latrans	Coyote	S5					X		
Vulpes vulpes	Red Fox	S5					X		
Felidae	**Felines**								
Lynx canadensis	Canada Lynx	S5	NAR	NAR	NS	No schedule	X		
Mephitidae	**Skunks and Stink Badgers**								
Mephitis mephitis	Striped Skunk	S5					X		
Mustelidae	**Weasels and Allies**								

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Ontario Mammal Atlas	NHIC Data**	Incidentals
Mustela frenata	Long-tailed Weasel	S4					X		
Mustela richardsonii	American Ermine	S5					X		
Neogale vison	American Mink	S4					X		
Taxidea taxus jacksoni	American Badger (Southwestern Ontario	S1	END	E	E	Schedule 1	X		
Procyonidae	**Raccoons and Allies**								
Procyon lotor	Northern Raccoon	S5					X		X
Artiodactyla	**Deer and Bison**								
Cervus elaphus	Elk	SNA	EXT				X		
Odocoileus virginianus	White-tailed Deer	S5					X		X
Total							**45**	**0**	**8**

*Mammal Atlas Square Numbers: 17MT82
**NHIC Atlas Squares: 17MH8124, 17MH8123, 17MH8223, 17MH8224, 17MH8024, 17MH8023

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Appendix IX
Fish Species Reported from the Study Area

Fish Species Reported from the Study Area - Kettle Creek Golf Course Port Stanley

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Aquatic Resource Area Data	NHIC Data*	NRSI Observed	Pond	Branch C	Branch B
		MNRF 2023a	MECP 2024	ernment of Canada	ernment of Canada	ernment of Canada	Government of Ontario 2022	MNRF 2023b	NRSI 2023	NRSI 2023	NRSI 2023	NRSI 2023
Clupeidae	**Herrings**											
Dorosoma cepedianum	Gizzard Shad	S4					X					
Cyprinidae	**Carps**											
Cyprinus carpio	Common Carp	SNA					X		X	X		
Leuciscidae	**Minnows**											
Carassius auratus	Goldfish	SNA							X		X	
Luxilus cornutus	Common Shiner	S5							X		X	
Macrhybopsis storeriana	Silver Chub	S2	THR	E	E	Schedule 1		X				
Notemigonus crysoleucas	Golden Shiner	S5							X		X	
Pimephales notatus	Bluntnose Minnow	S5	NAR	NAR	NS	No schedule	X		X		X	
Pimephales promelas	Fathead Minnow	S5					X		X		X	
Rhinichthys obtusus	Western Blacknose Dace	S5	0	0	0	0			X			X
Semotilus atromaculatus	Creek Chub	S5					X		X		X	X
Catostomidae	**Suckers**											
Catostomus commersonii	White Sucker	S5					X		X		X	X
Ictaluridae	**North American Catfishes**											
Ameiurus nebulosus	Brown Bullhead	S5					X					
Ictalurus punctatus	Channel Catfish	S4					X					
Esocidae	**Pikes**											
Esox lucius	Northern Pike	S5					X					
Salmonidae	**Trouts and Salmons**											
Oncorhynchus mykiss	Rainbow Trout	SNA					X					
Gasterosteidae	**Sticklebacks**											
Culaea inconstans	Brook Stickleback	S5							X		X	X
Moronidae	**Temperate Basses**											
Morone americana	White Perch	SNA					X					
Centrarchidae	**Sunfishes and Basses**											
Ambloplites rupestris	Rock Bass	S5					X					
Lepomis gibbosus	Pumpkinseed	S5					X		X	X	X	
Lepomis macrochirus	Bluegill	S5					X		X	X		
Micropterus dolomieu	Smallmouth Bass	S5					X					
Micropterus nigricans	Largemouth Bass	S5	0	0	0	0	X		X		X	
Pomoxis annularis	White Crappie	S4					X					
Pomoxis nigromaculatus	Black Crappie	S4					X					
Percidae	**Perches and Darters**											
Perca flavescens	Yellow Perch	S5					X					
Sciaenidae	**Drums and Croakers**											
Aplodinotus grunniens	Freshwater Drum	S5					X					
Total							**20**	**1**	**13**	**3**	**10**	**4**

*NHIC Atlas Square(s): 17MH8124, 17MH8123, 17MH8223, 17MH8224, 17MH8024, 17MH8023

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Appendix X
Lepidoptera (Butterfly) Species Reported from the Study Area

Butterfly Species Reported from the Study Area - Kettle Creek Golf Course, Port Stanley

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Ontario Butterfly Atlas*	NHIC Data**	NRSI Observed	CUT1	Ag	Golf Course	CUM1-1	Incidentals
		NDMNRF 2022	MECP 2022	Government of Canada 2022	Government of Canada 2022	Government of Canada 2022	Macnaughton et al. 2022	NDMNRF 2022	NRSI 2023	NRSI 2023	NRSI 2023	NRSI 2023	NRSI 2023	NRSI 2023
Hesperiidae	**Skippers**													
Ancyloxypha numitor	Least Skipper	S5					X		X	X				
Epargyreus clarus	Silver-spotted Skipper	S4					X							
Erynnis baptisiae	Wild Indigo Duskywing	S4					X							
Euphyes conspicua	Black Dash	S3					X							
Euphyes vestris	Dun Skipper	S5					X							
Hylephila phyleus	Fiery Skipper	SNA					X							
Pholisora catullus	Common Sootywing	S4					X							
Poanes hobomok	Hobomok Skipper	S5					X							
Polites origenes	Crossline Skipper	S4					X							
Polites peckius	Peck's Skipper	S5					X							
Polites themistocles	Tawny-edged Skipper	S5					X							
Thorybes pylades	Northern Cloudywing	S5					X							
Wallengrenia egeremet	Northern Broken Dash	S5					X							
Papilionidae	**Swallowtails**													
Battus philenor	Pipevine Swallowtail	SNA					X							
Papilio cresphontes	Giant Swallowtail	S4					X							
Papilio glaucus	Eastern Tiger Swallowtail	S5					X		X			X		
Papilio polyxenes	Black Swallowtail	S5					X							
Papilio troilus	Spicebush Swallowtail	S4					X							
Pieridae	**Whites and Sulphurs**													
Colias eurytheme	Orange Sulphur	S5					X							
Colias philodice	Clouded Sulphur	S5					X							
Pieris rapae	Cabbage White	SNA					X		X	X			X	X
Pontia protodice	Checkered White	SNA					X							
Pyrisitia lisa	Little Yellow	SNA					X							
Lycaenidae	**Harvesters, Coppers, Hairstreaks, Blues**													
Celastrina neglecta	Summer Azure	S5					X							
Celastrina sp.	Azure species	SNA					X							
Cupido comyntas	Eastern Tailed Blue	S5					X							
Satyrium acadica	Acadian Hairstreak	S4					X							
Satyrium calanus	Banded Hairstreak	S4					X							
Satyrium favonius ontario	Northern Oak Hairstreak	S1	THR	T	NS	No schedule		X						
Satyrium titus	Coral Hairstreak	S5					X							
Strymon melinus	Gray Hairstreak	S4					X							
Nymphalidae	**Brush-footed Butterflies**													
Cercyonis pegala	Common Wood-Nymph	S5					X							
Coenonympha california	Common Ringlet	S5					X		X	X				
Danaus plexippus	Monarch	S2N,S4B	SC	E	E	Schedule 1	X		X					X
Euptoieta claudia	Variegated Fritillary	SNA					X							
Junonia coenia	Common Buckeye	SNA					X							
Lethe anthedon	Northern Pearly-Eye	S5					X							
Lethe appalachia	Appalachian Brown	S4					X							
Libytheana carinenta	American Snout	SNA					X							
Limenitis archippus	Viceroy	S5					X							
Limenitis arthemis astyanax	Red-spotted Purple	S5					X		X				X	
Megisto cymela	Little Wood-Satyr	S5					X							
Nymphalis antiopa	Mourning Cloak	S5					X							
	Northern Crescent	S5					X		X	X	X			
	Eastern Comma	S5					X							
	Question Mark	S5					X							
	Great Spangled Fritillary	S5					X							
	Red Admiral	S5B					X		X			X		X
	Painted Lady	S5B					X							
	American Lady	S5					X							
							49	**1**	**8**	**4**	**1**	**2**	**2**	**3**

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Appendix XI
Odonate (Dragonfly and Damselfly) Species Reported from the Study Area

Odonate Species Reported from the Study Area - Kettle Creek Golf Course, Port Stanley

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Odonate Atlas*	NHIC Data**	NRSI Observed	Golf Course	FOD7	CUT1	CUM1-1	SWT2-2	FOD5-2
		MNRF 2023a	MECP 2022	Government of Canada 2022	Government of Canada 2022	Government of Canada 2022	OOAD 2022	MNRF 2023b	NRSI 2023	NRSI 2023	NRSI 2023	NRSI 2023	NRSI 2023	NRSI 2023	NRSI 2023
Calopterygidae	**Broadwinged Damselflies**														
Calopteryx maculata	Ebony Jewelwing	S5					X								
Hetaerina americana	American Rubyspot	S4					X								
Lestidae	**Spreadwings**														
Lestes dryas	Emerald Spreadwing	S5					X								
Lestes rectangularis	Slender Spreadwing	S5					X								
Coenagrionidae	**Narrow-winged Damselflies**														
Amphiagrion saucium	Eastern Red Damsel	S4					X								
Argia apicalis	Blue-fronted Dancer	S4					X								
Argia fumipennis violacea	Violet Dancer	S5					X								
Chromagrion conditum	Aurora Damsel	S5					X								
Enallagma antennatum	Rainbow Bluet	S4					X								
Enallagma basidens	Double-striped Bluet	S3					X								
Enallagma civile	Familiar Bluet	S5					X								
Enallagma ebrium	Marsh Bluet	S5					X								
Enallagma exsulans	Stream Bluet	S5					X								
Enallagma signatum	Orange Bluet	S4					X								
Ischnura posita	Fragile Forktail	S4					X								
Ischnura verticalis	Eastern Forktail	S5					X		X		X	X			
Nehalennia irene	Sedge Sprite	S5					X								
Aeshnidae	**Darners**														
Aeshna constricta	Lance-tipped Darner	S5					X								
Aeshna umbrosa	Shadow Darner	S5					X								
Anax junius	Common Green Darner	S5					X								
Epiaeschna heros	Swamp Darner	S3S4					X	X							
Corduliidae	**Emeralds**														
Dorocordulia libera	Racket-tailed Emerald	S5							X						X
Epitheca princeps	Prince Baskettail	S5					X								
Libellulidae	**Skimmers**														
Celithemis elisa	Calico Pennant	S5							X			X			
Leucorrhinia intacta	Dot-tailed Whiteface	S5					X								
Libellula luctuosa	Widow Skimmer	S5							X	X			X		
Libellula pulchella	Twelve-spotted Skimmer	S5					X								
Libellula quadrimaculata	Four-spotted Skimmer	S5					X								
Pachydiplax longipennis	Blue Dasher	S5					X								
Perithemis tenera	Eastern Amberwing	S4					X								
Plathemis lydia	Common Whitetail	S5					X		X	X			X	X	
Sympetrum corruptum	Variegated Meadowhawk	S3					X								
Sympetrum semicinctum	Band-winged Meadowhawk	S4					X								
Tramea lacerata	Black Saddlebags	S4					X								
Total							**30**	**1**	**4**	**2**	**1**	**2**	**2**	**1**	**1**

**Odonate Atlas Square Numbers: 17MH82*
***NHIC Square Numbers: 17MH8124, 17MH8123, 17MH8223, 17MH8224, 17MH8024, 17MH8023*

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Appendix XII
Tree Inventory and Preservation Plan

Kettle Creek Golf Course, Port Stanley

Tree Inventory and Protection Plan

Prepared for:

James Glover
Strathroy Turf Farms Ltd.
6297 Olde Drive
Appin, ON
N0L 1A0

Project No. 2982 | March 2025

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Kettle Creek Golf Course, Port Stanley

Tree Inventory and Protection Plan

Project Team

Nyssa Hardie	Ecohydrologist, Project Advisor
Jeremy Bannon	Terrestrial & Wetland Biologist, Certified Arborist, Project Manager
Kaitlin Filippov	GIS Specialist
Emma Glinny	Terrestrial & Wetland Biologist

Report submitted on March 5, 2025

Jeremy Bannon, B.E.S.

Terrestrial and Wetland Biologist / Certified Arborist (ON-1921A)

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Maps

1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained by landowner James Glover to complete a Tree Inventory and Protection Plan (TIPP) for a proposed residential development located at 320 Carlow Road, Port Stanley, Ontario, referred to herein as the subject property (Map 1). The larger study area includes adjacent lands and contiguous natural features.

The subject property is approximately 30ha in size and is currently an active golf course known as the Kettle Creek Golf and Country Club, located within the Municipality of Central Elgin, County of Elgin. The proposed residential development consists of single detached houses, condos, roadways, parkland, open space, and a stormwater management pond. This TIPP has been completed in accordance with the Elgin County Woodlands Conservation By-Law 05-03 (2021). The subject property borders Carlow Road to the east, a proposed subdivision to the north, a subdivision currently under construction to the south, and agricultural lands and woodlands to the west.

This TIPP was completed in consideration of Municipality of Central Elgin Official Plan (2023), Elgin County Official Plan (2015), and the Elgin County Woodlands Conservation By-Law 05-03 (2021). The By-Law states that:

> *"no person, through their own actions or through any other person's actions, shall harvest, destroy, or injure any living tree unless the person who is harvesting, destroying, or injuring trees has done so in accordance with Good Forestry practices and within the Circumference Limit."*

A proposed development on the subject property would fall under the exemptions identified in Section 3 d) of the By-Law, which states that the By-Law does not apply to:

> *"The injuring or destruction of trees imposed as a condition to the approval of site plan, a plan of subdivision or a consent under section 41, 51, or 53, respectively, of the Planning Act or as a requirement of a Site Plan agreement or subdivision agreement entered into under those sections."*

As per The Woodlands Conservation By-Law, any tree removal on or near sloped areas may require a permit from Elgin County.

There are areas of Significant Woodland, as defined by the Official Plan of the County of Elgin (2015) and the Municipality of Central Elgin Official Plan (2023), within the subject property and larger study area. The study area occurs in the Urban Settlement Area, as per the Municipality of Central Elgin Official Plan (2023). As shown on Schedule A2, woodlands occur in the subject property and study area. Only trees that directly impede the construction of buildings and services may be removed, and when trees are removed, they shall be compensated through replacement by other trees in sufficient amounts and maturity (Central Elgin 2023). As well, the protection, maintenance, and enhancement of existing woodlands is required, and setbacks from Significant Woodlands shall occur (Central Elgin 2023).

This report provides the findings of the tree inventory, analysis of proposed development against the trees' overall health and structural integrity, protection measures for trees to be retained, and recommended mitigation and compensation measures. Tree inventory data and mapping has been compared to the layout of the proposed concept plan that is current at the time of writing of this report, and prepared by Monteith Brown Planning Consultants (MBPC; February 6, 2025), as shown on Map 2.

2.0 Tree Inventory and Methodology

A comprehensive inventory and assessment of trees within the subject property was completed by NRSI Certified Arborists between July 7, 2023 and January 23, 2024. Trees located at the boundary of the subject property, as well as trees adjacent to the subject property with the potential to be impacted by the proposed development, were also included in the inventory and assessment. Trees within the woodlands on the subject property, which are proposed to be protected with 10m buffers from the dripline, were not inventoried.

The inventory included the tagging and assessment (overall health and potential for structural failure) of all trees ≥10cm in diameter at breast height (DBH) within and adjacent to the limits of grading associated with the proposed development. The locations of trees inventoried were subsequently surveyed by Certified Arborists using GPS units, providing mapping-grade, sub-meter accuracy. A complete list of trees that were assessed and their overall health and potential for structural failure is included in Appendix I.

The following information was recorded for each tree:

- Tree location;
- Tag number;
- Species (common and scientific name);
- DBH (centimetres) per stem >10cm;
- Number of stems;
- Crown radius (metres);
- General health (excellent, good, fair, poor, very poor, dead);
- Potential for structural failure (improbable, possible, probable, imminent);
- Potential cavities that could be used by Species at Risk (SAR) bats; and
- General comments (i.e., disease, aesthetic quality, development constraints, prune to reduce structural failure, sensitivity to development, etc.).

The overall health and potential for structural failure of each tree was assessed based on the criteria outlined in Appendix II (Dunster 2009; Dunster et al. 2013). NRSI has exercised a reasonable standard of care, skill and diligence as would be customarily and normally provided in carrying out these assessments. The assessments have been made using accepted arboricultural techniques. These include a visual examination of each tree for structural defects, scars, external indications of decay such as fungal fruiting bodies, evidence of insect attack, the condition of any visible root structures, the direction of stem lean (if any), the general condition

of the trees and the surrounding site, and the current or planned proximity of property and people. None of the trees examined on the property were dissected, cored, probed, or climbed and detailed root crown examinations involving excavation were not undertaken. The conditions for this assessment, including restrictions, professional responsibility, and third-party liability can be found in Appendix III.

3.0 Summary of Tree Inventory Findings

In total, 1124 trees were inventoried, comprising 48 species, the majority of which are located within the golf course. Of the tree species assessed, 26 (54%) are native and 22 (46%) are non-native.

None of the tree species observed are regionally significant or protected under the *Species at Risk Act* (2002) or *Endangered Species Act* (2007).

A complete list of inventoried trees is provided in Appendix I and tree locations are shown on Map 2. Appendix IV includes both a list of tree species inventoried, their health, and whether they are native or non-native, as well as a summary of the overall health of the trees inventoried and their potential for structural failure.

4.0 Tree Removal and Retention Analysis

The existing overall health and/or potential for structural failure was compared to the proposed concept plan to determine whether inventoried trees would be impacted by the proposed undertaking. Avoidance, mitigation, and protection measures for trees were examined to determine which trees would be impacted and which could be retained. The retention analysis presented below is based on the proposed concept plan prepared by MBPC (February 6, 2025; Map 2).

Many of the inventoried trees are considered to be boundary trees due to their main stem overlapping the subject property and an adjacent property. Removal, or injury (including to roots) of boundary or off-site trees will require the permission of all owners involved, as per the *Forestry Act* (R.S.O. 1990, c. F.26). If the main stem of any tree is located on multiple properties, all owners of those properties must be consulted before any tree removal occurs. NRSI is not aware of receipt of approval for these removals at this time, and our recommendation for removal should not be inferred to reflect any approval from any parties.

A total of 905 trees are anticipated to be removed based on the extent of the proposed development, and/or due to their health and potential for structural failure. The majority of the trees proposed for removal are in poor to good health with an improbable potential for structural failure, and range in size from 10cm to 114.8cm DBH.

A total of 219 trees are anticipated to be retained, as shown on Map 2. This includes 5 trees that may require pruning based on the proximity to development, or to reduce branch failure and encourage longer term structural integrity.

5.0 Tree Protection Measures and Recommended Mitigation

During the construction process, efforts will be made to protect the health and root systems of trees that have been assessed for retention in this plan. The Client, or their designate (e.g. construction inspector or site manager), must ensure that all employees and contractors are informed of the meaning and importance of tree protection measures and the ways in which trees to be retained are identified.

5.1 Prior to Construction and Site Alteration

Tree Protection Fencing (TPF) should be situated where trees are adjacent to the limit of disturbance/grading. A combination Erosion and Sediment Control (ESC) fence and TPF may be used where appropriate.

The TPF should be installed and maintained by the developer or its designate. Prior to any construction activities (rough grading, vegetation and tree removal), the TPF should be installed at least 1m beyond the dripline of the trees to be retained, where possible, in order to protect the root systems. Prior to works commencing on-site, fence installation and location shall be inspected by a Certified Arborist. In the absence of specifications from the County of Elgin or Municipality of Central Elgin, it is recommended that TPF should be at least 1.2m high on t-bar posts, topped with 2x4 planks with or orange plastic snow fence, or equivalent as approved by the Town.

5.1.1 Tree Removal Timing Windows

Migratory Birds

The removal of trees and vegetation has the potential to disrupt nesting birds. The schedule of on-site work must consider the *Migratory Birds Convention Act* (MBCA) (Government of Canada 2019) construction window. All tree and vegetation removal should occur outside of the core nesting period for migratory birds as established by the Canadian Wildlife Service (CWS) (2012). This period extends from approximately April 1 – August 31.

Raptors

The eggs and nests of all species of wild birds are also protected under the *Fish and Wildlife Conservation Act* (Government of Ontario 1997). This includes species identified as raptors (eg. Hawks and owls), which are not protected under the *Migratory Birds Convention Act*. It should be noted that some species of raptors breed and nest during the winter months in Ontario. Although no raptors or stick nests were observed during site visits, the forested

communities and adjacent areas within the subject property may provide suitable raptor nesting habitat. Therefore, care and consideration of the possible presence of winter nesting species should be executed should tree removal occur in the winter.

Species at Risk Bats

Northern Myotis (*Myotis septentrionalis*) is a SAR bat listed as Endangered both provincially and federally and Eastern Small-footed Myotis (*Myotis leibii)* is a SAR bat listed as Endangered provincially but not federally (MECP 2022, Government of Canada 2022). Both species are reported from the vicinity of the study area (Dobbyn 1994). These species and their habitats are protected by the provincial ESA. Habitat requirements for SAR bats in Ontario vary by season and consist of overwintering habitat, summer habitats, and swarming habitats (ECCC 2018). Overwintering or swarming habitats are not present within the subject property. Summer habitats include roosting habitat for maternity colonies and day roosts, as well as foraging habitat (ECCC 2018), which may be present within the subject property.

Based on recent guidance provided by the MECP, the removal of isolated trees (i.e., those located outside of a distinct treed vegetation community, such as the majority of trees to be removed within the subject property) is considered unlikely to cause significant impacts to SAR bats, and is therefore not expected to contravene the ESA; the MECP no longer recommends or supports bat habitat assessments or exit surveys that target individual trees (A. McAllister, pers. comm. 2020). Harm or harassment of any SAR bats that may be using these trees can be avoided as long as the trees are removed during the appropriate window; it is therefore recommended that all tree removals are avoided between April 1 – September 31, which coincides with the bat active season.

5.2 During Construction

The recommended TPF is to be maintained by the Client or its agents during the entire construction period to ensure that trees being retained (including their root systems) are protected. Minor construction damage (e.g., damage to limbs or roots) to trees to be retained must be pruned using proper arboricultural techniques. Root pruning, if necessary, should be performed by a Certified Arborist using an appropriate implement to make roper pruning cuts and encourage callous root growth. Should any of the trees intended to be retained be seriously damaged or die as a result of construction activities, the NRSI should be consulted to determine a plan of action, such as treatment or compensation.

Areas protected by TPF shall remain undisturbed and shall not be used for temporary storage, placement or excavation of fill or top soil, the storage of construction materials or equipment, or the storage of debris. Recognizing the root system of a tree often extends well beyond its dripline (i.e., outside the protected area), construction contaminants such as fuels, oils, etc. should be kept clear of areas protected by the TPF.

5.3 Post-Construction

It is recommended that the TPF be removed upon completion of construction activities and adjacent areas are stabilized with a suitable vegetative cover. Removal of TPF and revegetation will permit continued root development for the remaining trees. A Certified Arborist should inspect all retained trees and their rooting area, and recommend remediation work if conditions require it. A post-construction remediation plan may be required if damage to retained trees is noted. Following remediation activities, if needed, a final assessment should be done to ensure all protocols were met, ensuring final project approval.

6.0 Compensation

The Municipality of Central Elgin Official Plan requires that removed trees are compensated through replacement by other trees in sufficient amounts and maturity (Central Elgin 2023). NRSI suggests that all trees proposed to be removed that are in Fair to Excellent condition (comprising 732 trees) should be replaced at a 2:1 ratio, for a total of 1464 trees. These are expected to be planted within buffers and adjacent areas, as needed. Replacement plantings should be installed on the subject property, and are expected to be placed within the woodland and wetland buffers, and perhaps within the stormwater block. Species used for replacement/enhancement plantings should be native to Port Stanley, and the Municipality of Central Elgin encourages the use of native species in landscaping plans (Central Elgin 2023). Invasive species such as Norway Maple (*Acer platanoides*), Tree-of-Heaven (*Ailanthus altissima*), White Mulberry (*Morus alba*) or Sweet Cherry (*Prunus avium*) should be avoided.

It is recommended that any proposed planting plans, should they occur, follow these criteria:

- Be developed by, or reviewed and approved by an Ontario Landscape Architect (OLA) or Certified Arborist;
- Include plantings that are limited to non-invasive species, and native to Port Stanley;
- Include a diversity of trees from several genera to increase disease and pest tolerance and discourage monocultures (no more than 30% from a single genus, or 10% from a single species);
- Include a watering and monitoring plan for 2 years following planting;
- Space trees so as to allow material to reach its ultimate size and form;
- Provide trees with appropriate soil types and soil volumes;
- Avoid Ash species (*Fraxinus spp.*) due to the risk of the emerald ash borer (*Agrilus planipennis*),
- Avoid ‘messy trees’, such as fruiting trees or poplars (*Populus* spp.) where plantings occur in close proximity to driveways and roadways;
- Include spacing of plant material that accounts for the ultimate size and form of the selected species and also the purpose of the planting, whether it be for screening, shade, naturalizing, rehabilitation, etc.; and
- Provide special attention to location and height of trees in proximity to utilities.

7.0 Conclusion

NRSI was retained by James Glover to complete a tree inventory and Tree Protection Plan (TIPP) for a proposed residential development located at 320 Carlow Road, Port Stanley, Ontario (the subject property).

NRSI Certified Arborists conducted a comprehensive inventory and assessment of trees within the subject property on several visits between July 7, 2023 to January 23, 2024. Trees located at the boundary of the subject property, as well as trees adjacent to the subject property with the potential to be impacted by the proposed development, were also included in the inventory and assessment. A total of 1124 trees belonging to 48 native and non-native species were inventoried and assessed for removal within the subject property and boundaries. Of these, 905 are proposed for removal.

It is recommended that all proposed tree removals occur with consideration to the protection and general timing windows for migratory birds, raptors, and species at risk bats. It is required that written permission from impacted adjacent landowners be sought out and granted in advance of any boundary tree removals. TPF is to be installed prior to any on-site work, in order to provide adequate protection for retained trees and their root systems. In the absence of specifications from the County of Elgin or the Municipality of Central Elgin, it is recommended that fencing confirm to the standards of the nearby City of St. Thomas Municipal Tree Preservation By-law (2019).

NRSI suggests that all trees proposed to be removed that are in Fair to Excellent condition (comprising 732 trees) should be replaced at a 2:1 ratio, for a total of 1464 trees. These are expected to be planted within buffers and lands adjacent to buffers or within the stormwater block, if needed.

8.0 References

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Personal Communications

Aurora McAllister, Management Biologist, Permissions and Compliance, Species at Risk Branch, Ontario Ministry of Environment, Conservation and Parks. Email correspondence with Heather Fotherby, Terrestrial and Wetland Biologist, Natural Resource Solutions. June 16, 2020.

Appendix I
Tree Inventory Data

Kettle Creek Golf Course
Tree Inventory Data

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH 1 (cm)	DBH 2 (cm)	DBH 3 (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Proposed Action	Comments
201	Eastern White Pine	*Pinus strobus*	Native	1	40			2.0	Possible	Poor	Remove	Relatively extensive crown dieback; minor insect damage
206	Black Cherry	*Prunus serotina*	Native	1	24			3.0	Improbable	Good	Remove	Growing beneath crown of adjacent pine however crown not suppressed yet; minor dieback
207	Eastern White Pine	*Pinus strobus*	Native	1	43			2.5	Improbable	Fair	Remove	Light pruning dieback up main stem; slightly asymmetrical crown due to competition with adjacent tree
211	Black Cherry	*Prunus serotina*	Native	1	11			3.0	Improbable	Fair	Remove	Asymmetrical, slightly suppressed crown; otherwise relatively healthy
213	Green Ash	*Fraxinus pennsylvanica*	Native	2	12	10		3.0	Improbable	Fair	Remove	Minor crown dieback; bark cracks; slight phototrophic growth towards path
215	Eastern White Pine	*Pinus strobus*	Native	1	35			1.5	Improbable	Poor	Remove	Very narrow, suppressed crown with dieback
217	Eastern White Pine	*Pinus strobus*	Native	1	32			3.0	Improbable	Fair	Remove	Asymmetrical crown due to competition with adjacent tree; crown otherwise relatively healthy; wound on main stem with some decay
401	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	26			4.0	Improbable	Good	Remove	Landscape tree; light trunk lean; good crown form.
402	Blue Spruce	*Picea pungens*	Non-native	1	12			1.5	Improbable	Fair	Remove	Lower branches supressed, declining.
403	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	23			4.5	Improbable	Good	Remove	Erect form; full crown; minor epicormics pruned.
404	Blue Spruce	*Picea pungens*	Non-native	1	20			3.0	Improbable	Good	Remove	Landscape tree; light trunk sweep; good crown form.
405	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	25			5.0	Improbable	Good	Remove	Landscape tree; good crown and trunk form.
406	Freeman's Maple	*Acer x freemanii*	Native	1	27			4.0	Improbable	Good	Remove	Codominant at 1.5m; light trunk torsion.
407	Eastern White Pine	*Pinus strobus*	Native	1	23			2.5	Improbable	Fair	Remove	Fairly sparse crown with twig dieback; defected leader.
408	Norway Maple	*Acer platanoides*	Non-native	1	29			4.5	Improbable	Good	Remove	Erect form; full dense crown.
409	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	22			3.5	Improbable	Good	Remove	Erect form; full crown; minor epicormics.
410	London Plane-tree	*Platanus × hispanica*	Non-native	1	26			3.0	Improbable	Fair	Remove	Bow in lower trunk; vigorous crown; longitudinal cavity with good response growth.
411	Norway Maple	*Acer platanoides*	Non-native	1	21			3.0	Improbable	Fair	Remove	Central branch dieback.
412	White Ash	*Fraxinus americana*	Native	1	22			4.0	Possible	Fair	Remove	EAB; epicormic growth is still producing buds.
413	Common Hackberry	*Celtis occidentalis*	Native	1	15			2.5	Improbable	Good	Remove	Growing above sumacs.
414	Green Ash	*Fraxinus pennsylvanica*	Native	3	12	12	11	2.5	Improbable	Poor	Remove	Crown dieback; wounds along trunk; insect damage.
415	Common Hackberry	*Celtis occidentalis*	Native	1	25			5.0	Improbable	Good	Remove	Corrected main trunk lean; good crown form.
416	American Basswood	*Tilia americana*	Native	1	40			5.0	Improbable	Good	Remove	Large full crown; basal shoots; never pruned.
417	White Spruce	*Picea glauca*	Native	1	40			5.0	Improbable	Excellent	Remove	Excellent trunk and canopy form; good vigor.
418	Norway Maple	*Acer platanoides*	Non-native	1	19			2.5	Improbable	Good	Remove	Minor basal wound, mostly callused; full crown.
419	Norway Maple	*Acer platanoides*	Non-native	1	22			2.5	Improbable	Fair	Remove	Half of crown suppressed; old basal shoots heavily callused.
420	Eastern White Pine	*Pinus strobus*	Native	1	36			4.5	Improbable	Good	Remove	Some dieback in the upper canopy.
421	Blue Spruce	*Picea pungens*	Non-native	1	23			3.0	Improbable	Good	Remove	Suppressed to one side; healthy foliage.
422	American Basswood	*Tilia americana*	Native	1	24			4.0	Improbable	Fair	Remove	Light canopy competition; good form.
423	Blue Spruce	*Picea pungens*	Non-native	1	17			2.0	Improbable	Good	Remove	Healthy full upper crown; lower branches supressed
424	Norway Spruce	*Picea abies*	Non-native	1	40			3.0	Improbable	Good	Remove	Light canopy suppression but good vigor and form.
425	Blue Spruce	*Picea pungens*	Non-native	1	26			3.0	Improbable	Good	Remove	Full crown; good form.
426	Blue Spruce	*Picea pungens*	Non-native	1	23			2.5	Improbable	Poor	Retain	Twig dieback throughout; estimated 40 live crown.
427	White Spruce	*Picea glauca*	Native	1	23			3.0	Improbable	Fair	Retain	Asymmetrical canopy; fair vigor.
428	American Basswood	*Tilia americana*	Native	1	42			5.5	Improbable	Good	Retain	Slight trunk lean north; canopy has corrected.
429	Blue Spruce	*Picea pungens*	Non-native	1	24			2.0	Improbable	Fair	Retain	In spruce hedgerow; crown fairly suppressed.
430	Blue Spruce	*Picea pungens*	Non-native	1	26			3.0	Improbable	Fair	Retain	In spruce hedgerow; crown fairly suppressed.
431	Blue Spruce	*Picea pungens*	Non-native	1	21			2.5	Improbable	Fair	Retain	In spruce hedgerow; crown fairly suppressed.
432	Norway Spruce	*Picea abies*	Non-native	1	40			4.5	Improbable	Good	Retain	Good vigor.
433	American Basswood	*Tilia americana*	Native	1	37			5.0	Improbable	Good	Retain	Large full dense crown; previous clearance pruning.
434	White Ash	*Fraxinus americana*	Native	1	29			5.0	Probable	Poor	Retain	EAB; epicormic branching; lots of loose bark.
435	White Spruce	*Picea glauca*	Native	1	31			4.0	Improbable	Good	Retain	Healthy full crown, one side partially suppressed.
436	Norway Spruce	*Picea abies*	Non-native	1	28			5.0	Improbable	Good	Retain	Light asymmetrical crown vigor.
437	White Spruce	*Picea glauca*	Native	1	14			1.5	Improbable	Poor	Retain	Advanced crown dieback; estimated 80% deadwood.
438	White Spruce	*Picea glauca*	Native	1	20			3.0	Improbable	Fair	Retain	Necrotic needles; reduced vigor.
439	American Basswood	*Tilia americana*	Native	1	40			6.0	Improbable	Good	Retain	Vigorous growth; overgrown basal suckers; full dense crown.
440	White Spruce	*Picea glauca*	Native	1	32			5.5	Improbable	Good	Retain	Asymmetrical canopy.

Kettle Creek Golf Course
Tree Inventory Data

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH 1 (cm)	DBH 2 (cm)	DBH 3 (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Proposed Action	Comments
441	White Spruce	*Picea glauca*	Native	2	26	23		4.5	Improbable	Good	Remove	Healthy codominant leaders; twig dieback on suppressed side.
442	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	38			5.0	Improbable	Good	Remove	Good trunk and canopy form.
443	White Spruce	*Picea glauca*	Native	1	24			3.5	Improbable	Good	Remove	In spruce hedgerow; minor twig dieback throughout.
444	White Spruce	*Picea glauca*	Native	1	21			3.5	Improbable	Good	Remove	Slight canopy suppression.
445	White Spruce	*Picea glauca*	Native	1	24			4.0	Improbable	Good	Remove	Good form.
446	American Basswood	*Tilia americana*	Native	1	58			#VALUE!	Improbable	Good	Remove	Full large crown; codominant leaders with weak attachment.
447	White Spruce	*Picea glauca*	Native	1	23			3.0	Improbable	Good	Remove	Light asymmetrical canopy vigor.
448	White Spruce	*Picea glauca*	Native	1	21			2.5	Improbable	Good	Remove	Healthy, fairly tall narrow crown.
449	White Spruce	*Picea glauca*	Native	1	20			4.0	Improbable	Good	Remove	Good form and vigor.
450	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	31			6.0	Improbable	Good	Remove	Large-spreading crown; vigorous trunk and foliage.
451	Norway Maple	*Acer platanoides*	Non-native	1	45			5.5	Improbable	Fair	Remove	Light lean south; moderate interior twig dieback.
452	White Spruce	*Picea glauca*	Native	1	24			2.5	Improbable	Fair	Remove	In spruce hedge; dieback throughout suppressed half of crown.
453	White Spruce	*Picea glauca*	Native	1	21			2.5	Improbable	Fair	Remove	Asymmetrical canopy vigor.
454	White Spruce	*Picea glauca*	Native	1	23			4.0	Improbable	Good	Remove	Good form and vigor.
455	American Basswood	*Tilia americana*	Native	1	40			5.0	Improbable	Good	Remove	Healthy vigorous crown; weak attachments at main branching union; basal shoots.
456	White Ash	*Fraxinus americana*	Native	1	25			3.0	Probable	Dead	Remove	EAB.
457	White Spruce	*Picea glauca*	Native	1	28			3.5	Improbable	Good	Remove	Good form.
458	White Spruce	*Picea glauca*	Native	1	32			3.0	Improbable	Good	Remove	In spruce hedgerow; healthy foliage; partially suppressed.
459	White Spruce	*Picea glauca*	Native	1	20			2.0	Improbable	Poor	Remove	In spruce hedgerow; small crown, suppressed mid and lower crown.
460	White Spruce	*Picea glauca*	Native	1	28			3.5	Probable	Good	Remove	Good form.
461	White Spruce	*Picea glauca*	Native	1	23	20		3.5	Improbable	Fair	Remove	Included bark; suppressed canopy.
462	Norway Spruce	*Picea abies*	Non-native	1	30			3.5	Improbable	Good	Remove	In spruce hedgerow; old basal and trunk wounds, moderately callused; vigourous foliage.
463	American Basswood	*Tilia americana*	Native	1	46			6.0	Improbable	Fair	Retain	Slight lean northeast; epicormic branches.
464	White Spruce	*Picea glauca*	Native	1	23			3.0	Improbable	Fair	Retain	In spruce hedgerow; half of crown suppressed; minor twig dieback.
465	White Spruce	*Picea glauca*	Native	1	24			3.5	Improbable	Fair	Retain	Fair vigor.
466	White Spruce	*Picea glauca*	Native	1	30			4.0	Improbable	Fair	Retain	Suppressed canopy.
467	White Spruce	*Picea glauca*	Native	1	29			4.5	Improbable	Good	Retain	Good form and vigor.
468	Norway Spruce	*Picea abies*	Non-native	1	45			3.5	Improbable	Good	Retain	In spruce hedgerow; good form; vigorous crown.
469	American Basswood	*Tilia americana*	Native	1	28			4.0	Improbable	Good	Remove	Full vigorous crown; basal shoots; minor lower branch pruning.
470	White Spruce	*Picea glauca*	Native	1	15			2.5	Improbable	Fair	Remove	Sparse vigor in the middle.
471	American Basswood	*Tilia americana*	Native	1	30			3.0	Improbable	Fair	Remove	75% chlorotic foliage; minor twig dieback.
472	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	23			5.0	Improbable	Fair	Retain	Healthy crown; minor dead lower branches; old basal wound, mostly sealed.
473	Eastern White Pine	*Pinus strobus*	Native	1	36			4.5	Improbable	Good	Retain	Good form and vigor.
474	Eastern White Pine	*Pinus strobus*	Native	1	16			4.0	Improbable	Fair	Retain	Trunk and canopy competition.
475	Eastern White Pine	*Pinus strobus*	Native	1	32			4.0	Improbable	Good	Retain	Full vigorous crown, slightly chlorotic foliage.
476	White Spruce	*Picea glauca*	Native	1	24			4.0	Improbable	Fair	Retain	Full crown; somewhat chlorotic foliage; some twig dieback in midcrown
477	White Spruce	*Picea glauca*	Native	1	22			3.5	Improbable	Fair	Retain	Corrected sweep; fair vigor.
478	White Spruce	*Picea glauca*	Native	1	24			3.5	Improbable	Good	Retain	Full crown; somewhat chlorotic foliage; 5% twig dieback.
479	White Spruce	*Picea glauca*	Native	1	24			3.0	Improbable	Fair	Retain	Light trunk lean East; corrected sweep; lots of seed.
480	Blue Spruce	*Picea pungens*	Non-native	1	13			2.0	Improbable	Fair	Retain	Full upper crown; dieback of mid and lower crown.
481	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	30			5.5	Improbable	Good	Remove	Good form.
482	White Spruce	*Picea glauca*	Native	1	26			3.0	Improbable	Good	Remove	Full healthy crown.
483	White Spruce	*Picea glauca*	Native	1	26			2.0	Improbable	Fair	Retain	Lower crown branches suppressed; suppressed by adjacent cedar hedge.
484	White Spruce	*Picea glauca*	Native	1	24			4.0	Improbable	Good	Remove	Good form.
485	White Ash	*Fraxinus americana*	Native	1	19			3.0	Probable	Dead	Remove	Eab
486	White Spruce	*Picea glauca*	Native	1	28			4.5	Probable	Good	Remove	Healthy

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Tree Inventory Data

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH 1 (cm)	DBH 2 (cm)	DBH 3 (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Proposed Action	Comments
487	Black Pine	*Pinus nigra*	Non-native	1	22			3.5	Improbable	Fair	Retain	Suppressed canopy
488	White Spruce	*Picea glauca*	Native	1	32			3.5	Improbable	Fair	Retain	Healthy
489	Black Pine	*Pinus nigra*	Non-native	1	34			3.0	Improbable	Fair	Retain	Suppressed canopy; curved upper trunk.
490	White Spruce	*Picea glauca*	Native	1	18			2.5	Improbable	Fair	Retain	Suppressed canopy.
491	White Ash	*Fraxinus americana*	Native	1	14			2.5	Improbable	Fair	Retain	Suppressed canopy; curved upper trunk.
493	White Spruce	*Picea glauca*	Native	1	40			4.0	Improbable	Fair	Retain	Suppressed canopy.
494	Norway Spruce	*Picea abies*	Non-native	2	48	45		4.5	Improbable	Good	Remove	Large full healthy crown; codominant trunks with weak attachment.
495	Norway Spruce	*Picea abies*	Non-native	1	30			5.0	Improbable	Good	Remove	Tall tree; large crown with vigorous foliage; partially suppressed by maple.
496	White Spruce	*Picea glauca*	Native	1	22			2.0	Improbable	Fair	Retain	Suppressed canopy.
497	White Spruce	*Picea glauca*	Native	1	26			3.0	Improbable	Fair	Retain	Suppressed canopy.
498	Norway Maple	*Acer platanoides*	Non-native	1	43			4.0	Improbable	Fair	Retain	Suppressed canopy.
499	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	22			5.0	Improbable	Good	Remove	No major defects.
500	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	15			3.0	Improbable	Good	Remove	Landscape tree; good form.
501	White Spruce	*Picea glauca*	Native	1	11			2.0	Probable	Dead	Retain	Suppressed canopy.
502	White Spruce	*Picea glauca*	Native	1	22	14		4.0	Improbable	Good	Retain	Healthy
503	Black Walnut	*Juglans nigra*	Native	1	55			7.5	Improbable	Excellent	Retain	Large full crown; good form; no notable defects.
504	Willow sp.	*Salix sp.*	Native	1	21			4.0	Improbable	Good	Retain	Corrected trunk lean.
505	Eastern White Pine	*Pinus strobus*	Native	1	35			5.5	Improbable	Fair	Remove	Trunk wound, some callusing; foliage chlorotic; crown asymmetrical due to suppression.
506	Eastern White Pine	*Pinus strobus*	Native	1	21			3.5	Improbable	Good	Remove	Sparse lower canopy.
507	Green Ash	*Fraxinus pennsylvanica*	Native	1	25				Probable	Dead	Remove	Extensive bark loss; galleries; EAB exit holee
508	Eastern White Pine	*Pinus strobus*	Native	1	35			3.0	Improbable	Fair	Remove	Light pruning dieback; asymmetrical crown due to competition; Riverbank grape in lower scaffold
510	Black Walnut	*Juglans nigra*	Native	1	19			4.0	Improbable	Fair	Remove	Light pruning dieback; slightly asymmetrical due to competition with adjacent tree
513	Eastern White Pine	*Pinus strobus*	Native	2	61	47		4.0	Improbable	Fair	Remove	Included bark; 1 girdling root; light pruning dieback with Riverbank grape in lower scaffold
515	Black Walnut	*Juglans nigra*	Native	1	24			6.0	Improbable	Fair	Remove	Asymetrical crown due to competition with adjacent trees; self correcting root flare; minor dieback
518	Eastern White Pine	*Pinus strobus*	Native	1	28			2.0	Possible	Dead	Remove	On edge of wet/seep area with skunk cabbage; stem still relatively solid
519	Eastern White Pine	*Pinus strobus*	Native	1	48			5.0	Improbable	Fair	Remove	1 girdling root; some crown dieback throughout; included bark
523	Green Ash	*Fraxinus pennsylvanica*	Native	1	14			4.0	Improbable	Fair	Remove	Asymetrical crown due to competition with adjacent trees; slight phototrophic growth; minor dieback
524	Eastern White Pine	*Pinus strobus*	Native	1	24			1.0	Improbable	Poor	Remove	Narrow, suppressed crown; crown dieback; light pruning dieback
526	Sweet Cherry	*Prunus avium*	Non-native	1	12			2.5	Improbable	Fair	Remove	Wound on main stem with some minor decay but also compartmentalized; minor crown dieback; slightly suppressed crown
528	Green Ash	*Fraxinus pennsylvanica*	Native	1	13			3.0	Improbable	Fair	Remove	Slighlty suppressed and asymmetrical due to competition; minor dieback
529	Eastern White Pine	*Pinus strobus*	Native	1	25			1.5	Improbable	Fair	Remove	Light pruning up main stem; narrow crown due to competition; some dieback
531	Eastern White Pine	*Pinus strobus*	Native	1	25			1.5	Improbable	Poor	Remove	One sided crown with relatively extensive dieback
533	Eastern White Pine	*Pinus strobus*	Native	1	26			1.0	Improbable	Poor	Remove	Light pruning up main stem; very narrow, suppressed crown with dieback; self correcting root flare
534	Eastern White Pine	*Pinus strobus*	Native	1	34			1.5	Improbable	Fair	Remove	Asymmetrical crown due to competition; remaining side of crown relatively vigorous; small cavities up higher on main stem with compartmentalization
536	Green Ash	*Fraxinus pennsylvanica*	Native	1	12			4.0	Improbable	Fair	Remove	One sided, suppressed crown; some crown dieback
538	Eastern White Pine	*Pinus strobus*	Native	1	29			3.0	Improbable	Fair	Remove	One sided crown due to competition; crown towards path still relatively vigorous
540	Eastern White Pine	*Pinus strobus*	Native	1	32			2.0	Improbable	Fair	Remove	Well balanced root flare; asymmetrical crown due to competition
541	Eastern White Pine	*Pinus strobus*	Native	1	24			1.0	Improbable	Very Poor	Remove	Almost dead with only 1 canopy branch alive; stem still appears solid

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Tree Inventory Data

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH 1 (cm)	DBH 2 (cm)	DBH 3 (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Proposed Action	Comments
543	Green Ash	*Fraxinus pennsylvanica*	Native	1	13			1.5	Improbable	Fair	Remove	Root flare competition with adjacent tree; self correcting root flare; asymmetrical crown due to competition
545	Eastern White Pine	*Pinus strobus*	Native	1	40			2.5	Improbable	Fair	Remove	Well balanced root flare; light pruning up main stem; narrow crown however relatively healthy
547	Eastern White Pine	*Pinus strobus*	Native	1	35			4.0	Improbable	Poor	Remove	One sided crown with relatively extensive dieback
548	Eastern White Pine	*Pinus strobus*	Native	1	55			5.0	Possible	Very Poor	Remove	Crown has snapped off; 1 overextended scaffold branch; extensive dieback
550	Eastern White Pine	*Pinus strobus*	Native	1	23				Possible	Dead	Remove	Crown snapped off
552	Green Ash	*Fraxinus pennsylvanica*	Native	1	13			3.0	Improbable	Fair	Remove	Some crown competition with adjacent tree; minor dieback
553	White Willow	*Salix alba*	Non-native	1	43			4.0	Improbable	Fair	Remove	Asymmetrical crown; minor dieback; 1 scaffold broken and could benefit from being pruned off
555	Manitoba Maple	*Acer negundo*	Native	1	35			6.0	Possible	Fair	Remove	Phototrophic lean (10 degree) towards path; self correcting root flare; wound on main stem with evidence of decay however also compartmentalization; relatively full crown
557	Eastern White Pine	*Pinus strobus*	Native	1	42			6.0	Improbable	Fair	Remove	Slightly asymmetrical crown due to competition; crown otherwise quite vigorous
559	White Ash	*Fraxinus americana*	Native	1	10			2.0	Improbable	Good	Remove	Slightly suppressed due to adjacent tree; crown otherwise relatively vigorous; no signs of EAB on main stem
561	Eastern White Pine	*Pinus strobus*	Native	1	34			5.0	Improbable	Fair	Remove	Asymetrical crown due to competition with adjacent tree; immediately adjacent to path; minimal dieback
562	Eastern White Pine	*Pinus strobus*	Native	1	37			2.5	Improbable	Good	Remove	Light pruning up main stem; relatively full crown
565	Eastern White Pine	*Pinus strobus*	Native	1	23			4.0	Improbable	Fair	Remove	Light pruning dieback; asymmetrical crown due to competition with adjacent tree
566	Eastern White Pine	*Pinus strobus*	Native	1	27			3.0	Improbable	Fair	Remove	Light pruning up main stem; 2 over extended branches; minor dieback
567	White Ash	*Fraxinus americana*	Native	1	47			2.5	Possible	Very Poor	Remove	Galleries; epicormic growth; extensive crown dieback
569	Eastern White Pine	*Pinus strobus*	Native	1	26			2.0	Possible	Poor	Remove	Very narrow, suppressed crown with some dieback; 1 larger scaffold branch dead
572	Sweet Cherry	*Prunus avium*	Non-native	1	11			1.5	Improbable	Poor	Remove	Suppressed crown with relatively extensive dieback
573	Eastern White Pine	*Pinus strobus*	Native	1	33			2.0	Improbable	Poor	Remove	Light pruning up main stem; narrow, suppressed crown with dieback
575	Eastern White Pine	*Pinus strobus*	Native	1	21			1.0	Improbable	Poor	Remove	Very narrow, suppressed crown with extensive dieback
576	Eastern White Pine	*Pinus strobus*	Native	1	27			1.0	Improbable	Poor	Remove	Light pruning up main stem; narrow, suppressed crown with extensive dieback
578	Eastern White Pine	*Pinus strobus*	Native	1	27			2.0	Improbable	Fair	Remove	Narrow, asymmetrical crown; light pruning up main stem
579	Eastern White Pine	*Pinus strobus*	Native	1	43				Possible	Dead	Remove	Crown snapped; some bark loss; insect damage
580	Eastern White Pine	*Pinus strobus*	Native	1	16			2.0	Possible	Poor	Remove	Suppressed crown with dieback throughout
582	White Ash	*Fraxinus americana*	Native	1	23				Probable	Dead	Remove	Decay at base of main stem; galleries; EAB exit holes; crown dead
584	Eastern White Pine	*Pinus strobus*	Native	1	45			3.5	Improbable	Good	Remove	Slightly asymmetrical crown due to competition; crown otherwise relatively full; Riverbank grape in lower scaffold
586	Eastern White Pine	*Pinus strobus*	Native	1	34			2.0	Possible	Poor	Remove	Adjacent Ash tree has fallen into main stem; some minor bark scraping; narrow, suppressed crown with dieback
587	Eastern White Pine	*Pinus strobus*	Native	1	35				Possible	Dead	Remove	Missing crown; some bark loss
589	Eastern White Pine	*Pinus strobus*	Native	1	23			3.0	Improbable	Poor	Remove	Asymmetrical crown due to competition with adjacent trees; small wound on lower stem with compartmentalization; some crown loss
591	Eastern White Pine	*Pinus strobus*	Native	1	32			2.0	Improbable	Fair	Remove	Narrow crown due to competition with adjacent trees; a few bark rubs along main stem from adjacent Cherry
592	Black Cherry	*Prunus serotina*	Native	1	20			4.0	Improbable	Fair	Remove	Crown competition with adjacent tree; crown otherwise relatively healthy
594	Eastern White Pine	*Pinus strobus*	Native	1	31			2.0	Improbable	Fair	Remove	Asymmetrical crown due to competition with adjacent tree; light pruning up main stem; self correcting root flare as tree is growing out of sloped area
596	Eastern White Pine	*Pinus strobus*	Native	1	33			1.5	Improbable	Poor	Remove	Very narrow, suppressed crown with some dieback

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Tree Inventory Data

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH 1 (cm)	DBH 2 (cm)	DBH 3 (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Proposed Action	Comments
598	Green Ash	*Fraxinus pennsylvanica*	Native	1	19			3.0	Possible	Poor	Remove	Phototrophic growth with lower stem on 10 degree angle; crown dieback; loose bark
600	Eastern White Pine	*Pinus strobus*	Native	1	15			1.5	Improbable	Poor	Remove	One sided crown; suppressed with dieback; wound on upper stem with evidence of decay
601	White Spruce	*Picea glauca*	Native	1	12			2.5	Improbable	Good	Remove	Broken tree debris at base of tree.
602	Manitoba Maple	*Acer negundo*	Native	2	13	12		4.0	Improbable	Fair	Remove	Double leader; vines growing on canopy; slight lean.
603	Sweet Cherry	*Prunus avium*	Non-native	1	22			2.0	Improbable	Poor	Remove	Suckering throughout; branch tear off wound.
604	Black Walnut	*Juglans nigra*	Native	1	54			6.0	Improbable	Fair	Retain	Large cankers on trunk; evidence of branch failures.
605	Manitoba Maple	*Acer negundo*	Native	1	18			3.0	Improbable	Poor	Remove	Main trunk failed; single remaining stem growing upwards.
606	Common Pear	*Pyrus communis*	Non-native	3	25			3.5	Improbable	Fair	Remove	Three trunks now fused; slight lean south.
607	Manitoba Maple	*Acer negundo*	Native	1	37			6.0	Improbable	Fair	Retain	Growing on slight angle; double leader; vines in canopy.
608	Manitoba Maple	*Acer negundo*	Native	1	13			2.0	Improbable	Fair	Retain	Slight pistol butt; aggressive vines on trunk.
609	Black Walnut	*Juglans nigra*	Native	2	42	25		6.0	Improbable	Fair	Retain	Moderate lower branch dieback; two main trunks have begun fusing! Included bark.
610	Manitoba Maple	*Acer negundo*	Native	1	46			6.0	Improbable	Fair	Retain	Growing on lean; numerous basal shoots and epicormic shoots;.
611	White Spruce	*Picea glauca*	Native	1	26			4.0	Improbable	Good	Remove	Light canopy competition; good form and vigor.
612	White Spruce	*Picea glauca*	Native	1	36			4.0	Improbable	Fair	Remove	Good form; some self pruning.
613	White Spruce	*Picea glauca*	Native	1	34			5.0	Improbable	Good	Remove	Great form; healthy vigor.
614	White Spruce	*Picea glauca*	Native	1	38			4.0	Improbable	Fair	Remove	Good form; self pruning.
615	White Spruce	*Picea glauca*	Native	1	30			3.5	Improbable	Fair	Remove	Poor lower crown vigor; corrected trunk curve at 8m.
616	Black Pine	*Pinus nigra*	Non-native	1	24			3.0	Improbable	Poor	Remove	Over 75% dieback.
617	Eastern White Pine	*Pinus strobus*	Native	1	40			7.0	Improbable	Fair	Remove	Good form; self pruning.
618	Eastern White Pine	*Pinus strobus*	Native	1	36			5.0	Improbable	Fair	Remove	Good form; self pruning.
619	White Spruce	*Picea glauca*	Native	1	22			3.5	Improbable	Good	Remove	Slightly suppressed canopy.
620	White Spruce	*Picea glauca*	Native	1	36			4.5	Improbable	Good	Remove	Slight lean in trunk east.
621	Eastern White Pine	*Pinus strobus*	Native	1	41			6.0	Improbable	Fair	Remove	Good form; self pruning.
622	Red Pine	*Pinus resinosa*	Native	1	26			3.0	Improbable	Fair	Remove	Good form; self pruning.
623	Eastern White Pine	*Pinus strobus*	Native	1	23			3.0	Improbable	Poor	Remove	Poor vigor; corrected trunk form.
624	Red Pine	*Pinus resinosa*	Native	1	24			1.0	Probable	Dead	Remove	Rotted base; no crown; peelin bark.
625	White Ash	*Fraxinus americana*	Native	1	18			3.0	Possible	Fair	Remove	Still producing buds; heavy upper trunk lean north.
626	White Spruce	*Picea glauca*	Native	1	14			2.0	Improbable	Poor	Remove	Poor vigor; suppressed canopy.
627	White Ash	*Fraxinus americana*	Native	1	18			5.0	Improbable	Fair	Remove	Slight twist at base; cankers up trunk.
628	Red Pine	*Pinus resinosa*	Native	1	23			2.0	Possible	Dead	Remove	Wildlife feeding holes up trunk ; no crown; peeling bark.
629	White Spruce	*Picea glauca*	Native	1	35			3.5	Possible	Dead	Remove	Codominant above DBH; loosing bark.
630	White Spruce	*Picea glauca*	Native	1	32			2.0	Possible	Dead	Remove	No vigor; loosing bark.
631	White Spruce	*Picea glauca*	Native	1	26			1.0	Possible	Dead	Remove	Topped at 8m.
632	Red Pine	*Pinus resinosa*	Native	1	12			1.0	Possible	Dead	Remove	Peeling bark; no live crown.
633	White Ash	*Fraxinus americana*	Native	1	15			2.5	Improbable	Fair	Remove	Stunted growth; bark intact; limited EAB evidence.
634	Common Apple	*Malus pumila*	Non-native	1	16			3.5	Improbable	Fair	Remove	Canopy leans east; asymmetrical.
635	Red Pine	*Pinus resinosa*	Native	1	29			3.0	Improbable	Fair	Remove	Fair form; some self pruning.
636	White Ash	*Fraxinus americana*	Native	1	10			5.0	Possible	Poor	Remove	Growing on heavy lean due to large fallen tree at base.
637	White Ash	*Fraxinus americana*	Native	1	19			4.0	Improbable	Fair	Remove	Suppressed canopy; reduced vigor; lited EAB evidence.
638	Red Pine	*Pinus resinosa*	Native	1	39			3.0	Improbable	Fair	Remove	Fair form; some self pruning; thin crown.
639	Eastern White Pine	*Pinus strobus*	Native	1	19	15		2.5	Improbable	Fair	Remove	Included bark; sparse upper canopy; suppressed.
640	Red Pine	*Pinus resinosa*	Native	1	33			3.0	Possible	Dead	Remove	Wildlife holes; pleed off bark; minimal branches; lost top.
641	White Spruce	*Picea glauca*	Native	1	641			3.0	Improbable	Fair	Remove	Slight trunk lean east.
642	White Spruce	*Picea glauca*	Native	1	18				Possible	Dead	Remove	No vigor; lean west.
643	White Ash	*Fraxinus americana*	Native	1	19			5.0	Improbable	Fair	Remove	Growing on slight lean.
644	Eastern White Pine	*Pinus strobus*	Native	1	16			1.5	Possible	Poor	Remove	Poor vigor.
645	Eastern White Pine	*Pinus strobus*	Native	1	24			2.0	Possible	Dead	Remove	No vigor; rotted bark.
646	Red Pine	*Pinus resinosa*	Native	1	24			3.0	Possible	Dead	Remove	Peeling bark; no live crown .
647	Eastern White Pine	*Pinus strobus*	Native	1	14			2.0	Improbable	Poor	Remove	Suppressed canopy; poor vigor.
648	White Spruce	*Picea glauca*	Native	1	12			2.5	Improbable	Fair	Remove	Suppressed canopy; asymmetrical growth.
649	White Spruce	*Picea glauca*	Native	1	25			3.0	Improbable	Good	Remove	Canopy competition; reduced lower branch vigor.
650	White Spruce	*Picea glauca*	Native	1	19			2.5	Improbable	Fair	Remove	Suppressed canopy; reduced vigor.
651	Red Pine	*Pinus resinosa*	Native	1	42			5.0	Possible	Dead	Remove	Peeling bark; wildlife holes; no live branches.

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652	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	15			4.0	Improbable	Poor	Remove	Suppressed canopy; crown leans south.
653	White Spruce	*Picea glauca*	Native	1	13			1.0	Possible	Poor	Remove	Leaning; evidence of pruning; numerous dead branches.
654	White Spruce	*Picea glauca*	Native	1	15			2.5	Improbable	Fair	Remove	Corrected sweep trunk.
655	White Spruce	*Picea glauca*	Native	1	24			3.0	Improbable	Good	Remove	Slight upper trunk lean west from canopy competition.
656	White Spruce	*Picea glauca*	Native	1	16			2.0	Improbable	Fair	Remove	Slightly suppressed.
657	White Spruce	*Picea glauca*	Native	1	22			3.0	Improbable	Good	Remove	Suppressed lower canopy
658	White Spruce	*Picea glauca*	Native	1	30			4.0	Improbable	Fair	Remove	Slightly suppressed but good for..
688	Blue Spruce	*Picea pungens*	Non-native	1	40			3.0	Improbable	Good	Remove	Minor thinning.
801	Norway Maple	*Acer platanoides*	Non-native	1	23			2.5	Improbable	Good	Remove	Slightly asymetrical crown due to competition with adjacent tree; crown otherwise healthy; soil high against root flare
802	Blue Spruce	*Picea pungens*	Non-native	1	27			3.0	Possible	Poor	Remove	Relatively extensive crown dieback; soil high against main stem; evidence of decay on flare
803	Blue Spruce	*Picea pungens*	Non-native	1	31			3.0	Probable	Poor	Remove	Relatively extensive crown dieback; unbalanced root flare; soil high against main stem
804	Blue Spruce	*Picea pungens*	Non-native	1	31			3.0	Improbable	Fair	Remove	Crown dieback in lower branches; soil high against main stem
805	White Spruce	*Picea glauca*	Native	1	35			4.0	Improbable	Fair	Remove	1 girdling root; well balanced root flare; minor dieback; mower damage on 1 exposed root
806	White Spruce	*Picea glauca*	Native	1	32			4.0	Improbable	Fair	Remove	Relatively full, vigorous crown with minor dieback; heavy cone production
807	White Spruce	*Picea glauca*	Native	1	24			3.0	Improbable	Fair	Remove	Heavy cone production; some chlorotic stems with dieback
808	White Spruce	*Picea glauca*	Native	1	32			4.0	Improbable	Fair	Remove	Well balanced root flare; light pruning dieback and some dieback throughout; heavy cone production
809	White Spruce	*Picea glauca*	Native	1	24			2.0	Possible	Poor	Remove	Extensive crown dieback; wounds with sap ooze; evidence of decay at root flare
810	White Spruce	*Picea glauca*	Native	1	42			3.0	Improbable	Good	Remove	Well balanced, full crown; minimal dieback; heavy cone production
811	Blue Spruce	*Picea pungens*	Non-native	1	36			2.5	Improbable	Fair	Remove	On verge of poor; dieback throughout
812	White Spruce	*Picea glauca*	Native	1	22			2.5	Improbable	Poor	Remove	Dieback scattered throughout; heavy cone production
813	Norway Spruce	*Picea abies*	Non-native	1	27			3.5	Improbable	Fair	Remove	Slightly asymmetrical crown to south; healthy crown.
814	White Spruce	*Picea glauca*	Native	1	20			2.5	Improbable	Fair	Remove	On verge of poor; asymmetrical crown due to completition; crown dieback
815	Little-leaf Linden	*Tilia cordata*	Non-native	1	35			5.0	Improbable	Fair	Remove	Included bark on 2 main codominant stems; root girdling and water sprouts.
816	Norway Spruce	*Picea abies*	Non-native	1	25			4.0	Improbable	Fair	Remove	Asymmetrical crown to south; minor vine.
817	American Basswood	*Tilia americana*	Native	1	42			5.0	Improbable	Good	Remove	Girdling root; asymmetrical root flare; full, vigorous crown; solid main stem
818	Norway Spruce	*Picea abies*	Non-native	1	25			4.0	Improbable	Fair	Remove	Asymmetrical crown east; small twig dieback.
819	Blue Spruce	*Picea pungens*	Non-native	1	39			4.5	Improbable	Fair	Retain	Small twig dieback; stout.
820	Little-leaf Linden	*Tilia cordata*	Non-native	1	23			3.0	Improbable	Fair	Remove	Stem damage; dead and cracked branches; healthy remaining crown.
821	White Spruce	*Picea glauca*	Native	1	23			3.0	Improbable	Fair	Remove	Heavy cone production; some crown dieback; root flare competition with small Mulberry sapling
822	White Spruce	*Picea glauca*	Native	1	49			3.0	Improbable	Good	Remove	Relatively full, vigorous crown with minor dieback; heavy cone production.
823	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	27			4.5	Improbable	Fair	Remove	Leaning east; open wound on stem, but good compartmentalization; water sprouts.
824	White Spruce	*Picea glauca*	Native	1	37			3.0	Improbable	Good	Remove	Minor light pruning dieback; well balanced root flare; heavy cone production
825	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	37			5.0	Improbable	Fair	Remove	Small wounds with good compartmentalization; many codominant branches.
826	Blue Spruce	*Picea pungens*	Non-native	1	28			4.5	Improbable	Fair	Remove	Moderate small twig dieback.
827	Common Hackberry	*Celtis occidentalis*	Native	1	23			4.0	Improbable	Good	Remove	Full, well balanced crown; minor dieback; epicormic growth at root flare
828	White Spruce	*Picea glauca*	Native	1	20			4.0	Improbable	Good	Remove	Full and healthy crown.
829	Norway Maple	*Acer platanoides*	Non-native	1	10			2.0	Possible	Poor	Remove	Poor vigor; water sprouts; wounds.

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830	White Spruce	*Picea glauca*	Native	1	26			3.0	Improbable	Good	Remove	Full, vigorous crown; small bark cracks; heavy cone production
831	Freeman's Maple	*Acer x freemanii*	Native	1	41			5.0	Improbable	Good	Remove	Good form; healthy crown.
832	Little-leaf Linden	*Tilia cordata*	Non-native	1	22			4.5	Improbable	Fair	Remove	Codominant stems; minor cankers.
833	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	13			2.5	Improbable	Fair	Remove	Wound on lower stem with compartmentalization; some crown dieback
834	Common Hackberry	*Celtis occidentalis*	Native	1	83			3.5	Improbable	Good	Remove	Good form; healthy crown.
835	Norway Maple	*Acer platanoides*	Non-native	1	18			2.0	Improbable	Fair	Remove	Small bark cracks with staining; some compartmentalization
836	Blue Spruce	*Picea pungens*	Non-native	1	25			3.0	Improbable	Fair	Remove	Small branch dieback in lower limbs.
837	Little-leaf Linden	*Tilia cordata*	Non-native	1	11			1.5	Improbable	Poor	Remove	Large wound on stem; water sprouts; minor lean east.
838	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	19			3.0	Improbable	Fair	Remove	Epicormic growth; crown dieback; slightly asymmetrical
839	Sweet Crabapple	*Malus coronaria*	Native	1	14			1.5	Improbable	Fair	Remove	Epicormic growth; evidence of minor decay between branch union
840	Norway Maple	*Acer platanoides*	Non-native	1	18			4.0	Improbable	Fair	Remove	Codominant stems from clustered union; damage at base.
841	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	23			4.0	Possible	Fair	Remove	Fruiting bodies; small dead branches.
842	Norway Maple	*Acer platanoides*	Non-native	1	10			1.0	Possible	Poor	Remove	Wounds up main stem with some decay; some compartmentalization; crown dieback
843	Norway Maple	*Acer platanoides*	Non-native	1	16			2.5	Improbable	Fair	Remove	Minor dieback; tight crown.
844	White Oak	*Quercus alba*	Native	1	32			4.0	Improbable	Good	Remove	Full, well balanced crown; solid main stem
845	White Oak	*Quercus alba*	Native	1	39			6.0	Improbable	Good	Remove	Good form; minor infill; beside path.
846	White Spruce	*Picea glauca*	Native	1	40			4.0	Improbable	Fair	Remove	Heavy cone production; some branch tip dieback; slight phototrophic growth in main stem
847	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	18			3.0	Improbable	Poor	Remove	Fruiting bodies; open small wounds.
848	White Spruce	*Picea glauca*	Native	1	32			4.0	Possible	Poor	Remove	Major dead branches in lower crown.
849	Norway Spruce	*Picea abies*	Non-native	1	30			5.0	Improbable	Good	Remove	Dense crown; small cones.
850	Norway Maple	*Acer platanoides*	Non-native	1	35			5.0	Improbable	Fair	Remove	Girdling roots; history of branch failure with compartmentalization; full, well balanced crown
851	Blue Spruce	*Picea pungens*	Non-native	1	30			5.0	Possible	Poor	Remove	Significant dieback; lower 60% of crown nearly all dead.
852	Norway Maple	*Acer platanoides*	Non-native	1	32			4.5	Improbable	Good	Remove	Relatively full, vigorous crown; 1 root starting to girdle; compartmentalized prune cuts
853	Blue Spruce	*Picea pungens*	Non-native	1	30			4.0	Improbable	Poor	Remove	Lower 50% nearly dead.
854	Norway Maple	*Acer platanoides*	Non-native	1	29			6.0	Improbable	Fair	Remove	Large open crown; wounds; dieback; poor branch unions.
855	White Spruce	*Picea glauca*	Native	1	29			2.0	Possible	Very Poor	Remove	Extensive crown dieback; wound with decay on lower stem; some loose bark
856	Norway Maple	*Acer platanoides*	Non-native	1	39			4.0	Improbable	Good	Remove	Full, vigorous crown; compartmentalized prune cuts; could benefit from minor pruning to thin crown crowding
857	Blue Spruce	*Picea pungens*	Non-native	1	28			5.0	Improbable	Poor	Remove	Major dieback spread throughout.
858	Norway Maple	*Acer platanoides*	Non-native	1	39			5.0	Improbable	Good	Remove	Full, well balanced crown; compartmentalized prune cuts
859	White Spruce	*Picea glauca*	Native	1	18			4.0	Improbable	Fair	Remove	Moderate dieback throughout.
860	White Spruce	*Picea glauca*	Native	1	23			3.0	Improbable	Fair	Remove	Heavy cone production; sap ooze; some crown dieback
861	White Spruce	*Picea glauca*	Native	1	15			3.5	Possible	Poor	Remove	50% dead crown; some peeling bark.
862	White Spruce	*Picea glauca*	Native	1	26			3.0	Improbable	Fair	Remove	Heavy cone production; some crown dieback
863	Blue Spruce	*Picea pungens*	Non-native	1	25			3.5	Improbable	Fair	Remove	25% radial area dead.
864	Norway Spruce	*Picea abies*	Non-native	1	26			3.0	Improbable	Fair	Remove	Minor thinning.
865	Blue Spruce	*Picea pungens*	Non-native	1	13			3.0	Possible	Poor	Remove	90% dead; some brown needles.
866	White Spruce	*Picea glauca*	Native	1	19			2.5	Improbable	Fair	Remove	60% dieback; sap oozing.
867	Blue Spruce	*Picea pungens*	Non-native	1	17			1.5	Possible	Poor	Remove	Relatively extensive crown dieback; lower stem with phototrophic lean
868	Norway Spruce	*Picea abies*	Non-native	1	34			4.0	Improbable	Fair	Remove	Sapsucker damage; some dieback
869	Norway Spruce	*Picea abies*	Non-native	1	20			3.5	Improbable	Fair	Remove	Minor twig dieback.
870	Norway Maple	*Acer platanoides*	Non-native	1	29			4.5	Improbable	Fair	Remove	Codominant stems at clustered branch union; few small dead branches.

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871	Norway Maple	*Acer platanoides*	Non-native	1	17			3.0	Improbable	Fair	Remove	Seam up main stem with evidence of decay but also compartmentalizing; mower damage at root flare; crown still full
872	Eastern White Pine	*Pinus strobus*	Native	1	28			4.0	Improbable	Fair	Remove	Minor discoloration, likely due to time of year.
873	White Spruce	*Picea glauca*	Native	1	18			2.0	Improbable	Fair	Remove	Heavy cone production; minor dieback; old stem wound with wound wood
874	White Spruce	*Picea glauca*	Native	1	26			4.0	Improbable	Fair	Remove	Dieback in lower branches.
875	Eastern White Pine	*Pinus strobus*	Native	1	35			3.0	Improbable	Good	Remove	Relatively full crown; very minor dieback
876	White Spruce	*Picea glauca*	Native	1	13			2.5	Improbable	Fair	Remove	Minor twig dieback.
877	Eastern White Pine	*Pinus strobus*	Native	1	23			4.0	Improbable	Fair	Remove	Minor twig dieback.
878	White Fir	*Abies concolor*	Non-native	1	15			2.0	Improbable	Fair	Remove	Some root flare competition with Mulberry sapling; old wound on lower stem with compartmentalization; some dieback
879	White Fir	*Abies concolor*	Non-native	1	14			2.5	Possible	Poor	Remove	Moderate dieback throughout.
880	White Fir	*Abies concolor*	Non-native	1	25			4.0	Improbable	Poor	Remove	60% twig dieback.
881	Blue Spruce	*Picea pungens*	Non-native	1	25			4.0	Improbable	Fair	Remove	Minor twig dieback.
882	Blue Spruce	*Picea pungens*	Non-native	1	22			2.5	Improbable	Fair	Remove	On verge of poor with quite a bit of dieback; asymmetrical due to completition with adjacent tree
883	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	28			4.0	Possible	Fair	Remove	Slightly asymmetrical crown due to completition with adjacent tree; some crown dieback; old wound on root flare with decay
884	White Spruce	*Picea glauca*	Native	1	17			1.5	Probable	Very Poor	Remove	Extensive crown dieback; bark cracks on lower stem
885	White Spruce	*Picea glauca*	Native	1	32			4.0	Improbable	Fair	Remove	Minor discoloration.
886	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	27			5.0	Improbable	Fair	Remove	Minor epicormic growth; slightly asymetrical crown due to competition; some dieback
887	White Spruce	*Picea glauca*	Native	1	20			4.0	Improbable	Good	Remove	Minor thinning.
889	White Fir	*Abies concolor*	Non-native	1	17			1.5	Improbable	Fair	Remove	Previously topped; crown otherwise relatively full
890	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	30			5.0	Improbable	Good	Remove	Minor cankers.
891	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	29			4.0	Improbable	Fair	Remove	Minor epicormic growth; slightly asymmetrical due to completition with adjacent tree; crown dieback
892	Blue Spruce	*Picea pungens*	Non-native	1	27			4.0	Improbable	Fair	Remove	Minor thinning.
893	White Spruce	*Picea glauca*	Native	1	18			2.0	Improbable	Fair	Remove	Heavy cone production; some dieback
894	Blue Spruce	*Picea pungens*	Non-native	1	36			2.5	Improbable	Fair	Remove	On verge of poor with quite a bit of lower scaffold dieback
895	White Spruce	*Picea glauca*	Native	1	17			1.5	Improbable	Fair	Remove	On verge of poor with quite a bit of crown dieback; old mower damage at root flare
896	White Spruce	*Picea glauca*	Native	1	20			2.0	Improbable	Fair	Remove	On verge of poor; phototrophic lean; some crown dieback; heavy cone production
897	American Basswood	*Tilia americana*	Native	1	36			4.0	Improbable	Good	Retain	Epicormic sprouts at root flare; full, vigorous crown; some mower damage on exposed roots; could benefit from minor pruning to reduce crowding
898	Norway Spruce	*Picea abies*	Non-native	1	40			5.0	Improbable	Fair	Remove	Minor twig dieback, particularly where shaded.
899	Norway Maple	*Acer platanoides*	Non-native	1	29			3.0	Improbable	Good	Remove	Old seam up main stem sealed over; compartmentalization on lower stem wounds from mower damage; full crown
900	White Fir	*Abies concolor*	Non-native	1	30			4.0	Improbable	Fair	Remove	Major thinning where shaded by maple.
956	Eastern White Pine	*Pinus strobus*	Native	1	36			5.5	Improbable	Good	Remove	Tall healthy crown.
963	Eastern White Pine	*Pinus strobus*	Native	1	31			3.0	Improbable	Good	Retain	Slightly asymmetrical crown due to competition with adjacent tree; minor light pruning dieback only
964	Eastern White Pine	*Pinus strobus*	Native	1	36			4.5	Improbable	Good	Remove	Full, vigorous crown with very minor dieback; well balance root flare
965	American Basswood	*Tilia americana*	Native	8	17	13	12	4.0	Improbable	Fair	Remove	Multi stem with epicormic growth; slightly asymmetrical crown due to completition with adjacent tree
966	Eastern Cottonwood	*Populus deltoides*	Native	1	53			6.0	Improbable	Fair	Remove	Minor water sprouts; good form.
967	White Spruce	*Picea glauca*	Native	1	24			3.0	Improbable	Fair	Remove	Heavy cone production; some crown dieback
969	White Spruce	*Picea glauca*	Native	1	24			2.0	Improbable	Poor	Remove	Chlorotic; evidence of decay in main stem; crown dieback

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970	Eastern White Pine	*Pinus strobus*	Native	1	37			6.0	Improbable	Good	Remove	Tall healthy crown.
971	Eastern White Pine	*Pinus strobus*	Native	1	42			5.0	Improbable	Good	Remove	Slightly asymmetrical crown due to competition with adjacent tree; crown otherwise vigorous
972	Eastern White Pine	*Pinus strobus*	Native	1	37			5.0	Improbable	Good	Remove	Slightly asymmetrical crown due to completition with adjacent tree; crown otherwise vigorous
973	American Basswood	*Tilia americana*	Native	6	19	18	17	4.0	Improbable	Good	Remove	Relatively full, vigorous crown
974	White Spruce	*Picea glauca*	Native	1	21			3.5	Improbable	Fair	Remove	Major thinning in lower crown.
975	White Spruce	*Picea glauca*	Native	1	27			3.5	Improbable	Fair	Remove	Moderate dieback in lower crown.
977	Eastern White Pine	*Pinus strobus*	Native	1	50			4.0	Improbable	Good	Remove	Slightly asymmetrical crown due to competition with adjacent tree; crown otherwise full; solid main stem
978	Eastern White Pine	*Pinus strobus*	Native	1	38			4.0	Possible	Poor	Remove	Extensive crown dieback; insect damage; blister rust
979	White Ash	*Fraxinus americana*	Native	1	14			2.0	Probable	Very Poor	Remove	Exfoliating bark; extensive water sprouts; extreme die back; exit holes.
981	White Spruce	*Picea glauca*	Native	1	27			4.5	Improbable	Fair	Remove	Thinning where shaded out.
984	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	20			4.0	Improbable	Fair	Remove	Fruiting bodies; significant small dead branches.
985	Eastern White Pine	*Pinus strobus*	Native	1	46			6.0	Improbable	Good	Remove	Tall canopy; good form; minor oozing on main stem.
986	American Basswood	*Tilia americana*	Native	1	25			5.0	Improbable	Fair	Remove	Large water sprouts at base; codominant stems.
987	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	18			4.0	Improbable	Good	Remove	Relatively full, vigorous crown with minor competition from adjacent tree; sealed bark seam
988	Eastern Cottonwood	*Populus deltoides*	Native	1	47			4.0	Improbable	Fair	Remove	Lower scaffold dieback; evidence of decay on root flare and lower stem
989	American Basswood	*Tilia americana*	Native	1	33			5.0	Improbable	Fair	Remove	Extensive water sprouts at base; poor branch unions.
990	White Spruce	*Picea glauca*	Native	1	26			3.5	Improbable	Fair	Remove	Moderate thinning in lower crown; codominant stems; oozing; relatively poor vigor.
991	American Basswood	*Tilia americana*	Native	1	26			4.0	Improbable	Fair	Remove	Epicormic growth at root flare; full crown with crowding; some weak branch unions.in upper crown
992	Blue Spruce	*Picea pungens*	Non-native	1	34			4.5	Improbable	Fair	Remove	Major small twig die-back on shaded western side.
993	Eastern White Pine	*Pinus strobus*	Native	1	45			5.5	Improbable	Good	Remove	Tall healthy full crown
994	White Spruce	*Picea glauca*	Native	1	19			2.0	Improbable	Fair	Remove	Heavy cone production; bark cracks along main stem with sap ooze; some crown dieback
995	American Basswood	*Tilia americana*	Native	1	32			5.5	Improbable	Fair	Remove	Poor branch unions; minor wounds on stem with good compartmentalization.
996	White Spruce	*Picea glauca*	Native	1	24			2.0	Improbable	Poor	Remove	Dieback along one side of crown; bark cracks
997	Eastern White Pine	*Pinus strobus*	Native	1	33			6.5	Improbable	Good	Remove	Minor thinning; minor wound from broken branch.
998	American Basswood	*Tilia americana*	Native	1	29			5.0	Improbable	Fair	Remove	Epicormic growth at root flare; some overcrowding in crown; could benefit from pruning
999	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	18			4.0	Possible	Fair	Remove	Significant dead branches; minor wounds on stem.
1000	White Spruce	*Picea glauca*	Native	1	31			3.0	Improbable	Fair	Remove	On verge of poor with dieback along one side of crown; bark cracks with sap ooze
1001	Blue Spruce	*Picea pungens*	Non-native	1	18			2.0	Improbable	Good	Remove	Asymmetrical crown due to competition with adjacent tree; healthy crown.
1002	Norway Spruce	*Picea abies*	Non-native	1	23			3.0	Improbable	Good	Remove	Few pruning cuts; good form; healthy crown.
1003	Blue Spruce	*Picea pungens*	Non-native	1	12			1.0	Possible	Very Poor	Remove	90% canopy dieback; slight lean.
1004	Blue Spruce	*Picea pungens*	Non-native	1	27			2.5	Possible	Fair	Remove	Self-corrected lean; extensive vine growth.
1005	White Ash	*Fraxinus americana*	Native	1	49			4.5	Possible	Very Poor	Remove	Minimal live crown remaining; codominant leaders; epicormic shoots.
1006	White Mulberry	*Morus alba*	Non-native	1	30			4.0	Improbable	Fair	Remove	Sprawling crown; multiple small stems; phototrophic growth.
1007	Other	*Unknown*	Unknown	1	25	24		4.0	Possible	Dead	Remove	Codominant leaders; included bark; bark loss; decay.
1008	White Mulberry	*Morus alba*	Non-native	1	24			3.5	Possible	Very Poor	Remove	80% dieback; curved stem; poor attachment.
1009	White Ash	*Fraxinus americana*	Native	1	44			6.0	Possible	Fair	Remove	10% canopy dieback; good form; all surgical galls on stem.
1010	White Mulberry	*Morus alba*	Non-native	1	26			3.0	Improbable	Fair	Remove	Past pruning cuts; lower branch dieback; bacterial ooze.
1011	White Mulberry	*Morus alba*	Non-native	1	14			3.5	Possible	Poor	Remove	Asymmetrical crown due east; trunk fissure; 40% canopy dieback.
1012	White Mulberry	*Morus alba*	Non-native	1	11			5.0	Possible	Fair	Remove	Leans east; lower crown dieback; phototrophic crowth.

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1013	White Mulberry	*Morus alba*	Non-native	1	18			4.5	Improbable	Fair	Remove	Minor branch dieback; healthy crown; good form; vine growth.
1014	Eastern White Cedar	*Thuja occidentalis*	Native	1	23			3.0	Improbable	Fair	Remove	Sparse crown; intensive poison ivy growth resulting in canopy competition and possible girdling.
1015	White Mulberry	*Morus alba*	Non-native	1	13			3.0	Improbable	Fair	Remove	Upright form; crown mostly intact.
1016	White Mulberry	*Morus alba*	Non-native	1	10			3.0	Improbable	Fair	Remove	Upright form; mostly intact crown.
1017	Common Apple	*Malus pumila*	Non-native	1	11			4.0	Possible	Fair	Remove	Heavy lean west; curved stem; pressure from adjacent dead snag.
1018	White Ash	*Fraxinus americana*	Native	1	33			4.0	Possible	Dead	Remove	EAB galleries; loose bark; woodpecker holes; intensive vine growth.
1019	White Mulberry	*Morus alba*	Non-native	1	39	34		6.0	Possible	Good	Remove	Codominant stems; three leaders; included bark; vine growth; sprawling form.
1020	White Mulberry	*Morus alba*	Non-native	1	11			3.0	Probable	Good	Remove	Failed leader resulting in lateral stem growth; very weak attachment.
1021	Common Apple	*Malus pumila*	Non-native	1	20			5.0	Possible	Poor	Remove	Leans west; epicormic shoots; phototrophic growth; failed branches.
1022	Eastern White Cedar	*Thuja occidentalis*	Native	1	16			2.5	Improbable	Fair	Remove	Heavily shaded by adjacent trees; weak leader; sparse crown.
1023	White Mulberry	*Morus alba*	Non-native	3	39	26	16	5.0	Possible	Good	Remove	Multiple codominant leaders; second stem connected at root flare; included bark with bulging growth; bacterial ooze.
1024	White Mulberry	*Morus alba*	Non-native	1	23			5.0	Improbable	Good	Remove	Sealed stem fissure; minor vine growth.
1025	White Mulberry	*Morus alba*	Non-native	1	20			3.5	Improbable	Fair	Remove	Crown suppression; some canopy dieback from light stress.
1026	White Mulberry	*Morus alba*	Non-native	2	46	29		6.0	Possible	Good	Remove	Codominant, diverging stems; included bark; sprawling crown.
1027	Black Cherry	*Prunus serotina*	Native	2	68	39		6.0	Possible	Good	Remove	Historical structural branch failure; codominant stems; included bark; vine growth.
1028	Common Apple	*Malus pumila*	Non-native	2	15	13		3.5	Possible	Fair	Remove	Staining around root flare; codominant stems; included bark; leaning over path.
1030	Common Apple	*Malus pumila*	Non-native	1	18			3.0	Improbable	Good	Remove	Codominant leaders; included bark; slight lean towards trail; healthy crown.
1031	White Ash	*Fraxinus americana*	Native	1	20			4.5	Improbable	Fair	Remove	Full crown; bark splitting indicative of EAB infestation.
1032	Eastern White Cedar	*Thuja occidentalis*	Native	1	17			1.5	Possible	Poor	Remove	Many stem wounds; suppressed canopy; vine growth.
1033	White Ash	*Fraxinus americana*	Native	1	22			3.5	Possible	Very Poor	Remove	80% dieback; bark splitting; EAB; woodpecker holes.
1034	Common Apple	*Malus pumila*	Non-native	1	13			2.5	Possible	Fair	Remove	Past pruning cuts; bark splitting; crown overhanging path.
1036	Eastern Cottonwood	*Populus deltoides*	Native	1	48			5.0	Improbable	Fair	Remove	Extensive vine growth on lower half of tree; minor defoliation.
1037	Eastern Cottonwood	*Populus deltoides*	Native	1	51			4.0	Improbable	Good	Remove	Healthy crown; good form; some vine growth.
1038	Eastern Cottonwood	*Populus deltoides*	Native	1	115			6.0	Possible	Good	Remove	Codominant stems; burl; historical branch failure; healthy crown.
1039	Hawthorn sp.	*Crataegus sp.*	Native	3	19	17	17	4.0	Possible	Poor	Remove	Multiple mid-sized stems; fused stems; epicormic shoots; historical failure; fruiting bodies; cavities.
1041	Common Apple	*Malus pumila*	Non-native	1	26	24	21	7.0	Possible	Fair	Remove	Multiple mid-sized stems; basal cavity; girdling roots; epicormic shoots.
1042	White Ash	*Fraxinus americana*	Native	1	20			3.0	Improbable	Fair	Remove	Healthy crown; minor defoliation; few stem wounds, sealed.
1043	White Ash	*Fraxinus americana*	Native	1	25			4.0	Improbable	Good	Remove	Healthy crown; no visible EAB damage.
1044	White Ash	*Fraxinus americana*	Native	1	24			3.5	Improbable	Good	Remove	Slight lean south; healthy crown; minor defoliation.
1045	White Ash	*Fraxinus americana*	Native	1	31			4.0	Possible	Very Poor	Remove	Live growth limited to few epicormic shoots; loose bark; EAB.
1046	Common Apple	*Malus pumila*	Non-native	3	35	28	27	5.0	Possible	Good	Remove	Codominant stems; included bark; fused tissue; healthy and full crown.

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1047	Willow sp.	*Salix sp.*	Native	3	26	13	12	3.0	Improbable	Fair	Remove	Low lateral branch; vine growth; lower branch dieback from light stress.
1048	Eastern Cottonwood	*Populus deltoides*	Native	1	60			4.5	Possible	Good	Remove	Codominant stems; heavy vine growth may cause failure of lower branch; healthy crown.
1049	Trembling Aspen	*Populus tremuloides*	Native	1	26			3.0	Improbable	Good	Remove	Basal wound with exposed cambium, likely mower damage; healthy crown; minor twig dieback.
1050	Trembling Aspen	*Populus tremuloides*	Native	1	13			1.0	Probable	Dead	Remove	Snag.
1051	Trembling Aspen	*Populus tremuloides*	Native	1	21			2.5	Probable	Dead	Remove	Loose bark; insect galleries; decay.
1052	Trembling Aspen	*Populus tremuloides*	Native	1	21			3.5	Possible	Good	Remove	Sealed stem wound; exposed cambium; vine growth.
1053	Trembling Aspen	*Populus tremuloides*	Native	1	15			3.0	Possible	Fair	Remove	Dead second leader; suppressed crown; lower branch dieback.
1054	Trembling Aspen	*Populus tremuloides*	Native	1	23			3.5	Improbable	Good	Remove	Healthy crown; good form.
1055	Trembling Aspen	*Populus tremuloides*	Native	1	20			3.0	Possible	Good	Remove	Healthy crown; extensive vine growth throughout canopy.
1056	White Mulberry	*Morus alba*	Non-native	1	16			2.0	Probable	Dead	Remove	Armillaria root rot; fruiting bodies.
1057	Northern Red Oak	*Quercus rubra*	Native	1	38			6.0	Possible	Fair	Remove	Necrotic, warped leaves; defoliation; 20% dieback; asymmetrical crown; eroding base around path.
1058	Trembling Aspen	*Populus tremuloides*	Native	1	21			3.0	Possible	Good	Remove	Extensive vine growth; limited but healthy crown.
1059	Manitoba Maple	*Acer negundo*	Native	1	10			2.5	Improbable	Fair	Remove	Basal shoots; leans east.
1060	Trembling Aspen	*Populus tremuloides*	Native	1	19			4.0	Possible	Fair	Remove	Phototrophic leader, curved stem; extensive vine growth.
1061	Trembling Aspen	*Populus tremuloides*	Native	1	23			3.5	Possible	Fair	Remove	Extensive vine growth throughout canopy; lower branch dieback.
1062	Trembling Aspen	*Populus tremuloides*	Native	1	29			5.0	Improbable	Good	Remove	Healthy crown; minor dieback; vine growth.
1063	Trembling Aspen	*Populus tremuloides*	Native	1	22			4.0	Possible	Poor	Remove	60% dieback; historical branch failure.
1064	Trembling Aspen	*Populus tremuloides*	Native	1	24			4.0	Improbable	Good	Remove	Healthy crown; grapevine.
1065	Trembling Aspen	*Populus tremuloides*	Native	1	24			2.5	Improbable	Good	Remove	Narrow, healthy crown; vine growth.
1066	Trembling Aspen	*Populus tremuloides*	Native	1	16			3.0	Improbable	Good	Remove	Extensive vine growth in lower crown; lower branch dieback.
1067	Common Pear	*Pyrus communis*	Non-native	3	31	25	17	5.5	Possible	Fair	Remove	Healthy crown; sapsucker holes; some loose bark; historical pruning cuts.
1068	American Elm	*Ulmus americana*	Native	1	20			3.5	Possible	Dead	Remove	Dutch elm disease; loose bark.
1069	Northern Red Oak	*Quercus rubra*	Native	1	46			6.5	Improbable	Fair	Remove	10% dieback; good attachment; minor defoliation.
1070	Trembling Aspen	*Populus tremuloides*	Native	1	15			4.5	Possible	Poor	Remove	40% dieback; curved base; phototrophic lean.
1071	Trembling Aspen	*Populus tremuloides*	Native	1	17			3.0	Improbable	Fair	Remove	Leaning towards trail; phototrophic growth; healthy crown.
1072	American Beech	*Fagus grandifolia*	Native	1	23			5.0	Improbable	Fair	Remove	Beech leaf disease; epicormic shoots; no apparent dieback.
1073	Common Apple	*Malus pumila*	Non-native	3	31	29	29	5.0	Possible	Poor	Remove	Large basal wound with decay from stem failure; 25% dieback; fused tissue; weak attachment.
1074	Trembling Aspen	*Populus tremuloides*	Native	1	16			2.0	Improbable	Fair	Remove	20% dieback; curved stem.
1075	Trembling Aspen	*Populus tremuloides*	Native	1	14			4.0	Improbable	Fair	Remove	Minor canopy dieback; awkward phototrophic leader orientation; possible weak attachment.
1076	Trembling Aspen	*Populus tremuloides*	Native	1	18			3.0	Improbable	Good	Remove	Healthy crown; competing shrubs and vines in lower canopy.
1077	Trembling Aspen	*Populus tremuloides*	Native	1	15			2.0	Possible	Dead	Remove	Decay visible along stem; fruiting bodies; vine growth in canopy.
1078	Trembling Aspen	*Populus tremuloides*	Native	1	13			1.0	Possible	Dead	Remove	Near total bark loss; surficial decay.
1079	Trembling Aspen	*Populus tremuloides*	Native	1	15			1.0	Possible	Dead	Remove	Near total bark loss; surficial decay.
1080	American Beech	*Fagus grandifolia*	Native	1	17			3.0	Possible	Poor	Remove	Beech leaf disease; necrosis; 50% dieback.
1081	Trembling Aspen	*Populus tremuloides*	Native	1	16			1.0	Possible	Dead	Remove	Near total bark loss; surficial decay; american bittersweet in canopy.
1082	Trembling Aspen	*Populus tremuloides*	Native	2	14	14		4.0	Possible	Fair	Remove	Diverging codominant stems; growing at edge of steep slope; included bark.
1083	Trembling Aspen	*Populus tremuloides*	Native	1	10			2.0	Possible	Dead	Remove	Snag; at edge of steep slope.
1084	Trembling Aspen	*Populus tremuloides*	Native	1	13			4.5	Improbable	Fair	Remove	Slight lean towards clearing; minor defoliation.

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1085	Trembling Aspen	*Populus tremuloides*	Native	1	16			2.5	Improbable	Fair	Remove	Curved stem; grapevine; minor defoliation.
1086	Trembling Aspen	*Populus tremuloides*	Native	1	15			2.0	Possible	Dead	Remove	Honey mushrooms indicative of root rot.
1087	Trembling Aspen	*Populus tremuloides*	Native	1	14			4.0	Improbable	Good	Remove	Leans towards clearing; full from pathway around root flare; extensive grapevine growth.
1088	Trembling Aspen	*Populus tremuloides*	Native	1	16			3.0	Improbable	Good	Remove	Curved stem; extensive grapevine growth.
1089	Trembling Aspen	*Populus tremuloides*	Native	1	18			3.0	Improbable	Fair	Remove	Curved stem, possibly from historic failure of leader; extensive grapevine growth.
1090	Trembling Aspen	*Populus tremuloides*	Native	1	18			2.5	Improbable	Fair	Remove	Minor defoliation; extensive grapevine growth.
1091	Trembling Aspen	*Populus tremuloides*	Native	1	19			5.0	Possible	Fair	Remove	Branches overextended into clearing; minor twig dieback.
1092	Trembling Aspen	*Populus tremuloides*	Native	1	18			2.5	Improbable	Fair	Remove	Curved stem; grapevine throughout canopy; healthy crown.
1093	Trembling Aspen	*Populus tremuloides*	Native	1	12			2.0	Probable	Dead	Remove	Leaning into clearing; vine growth.
1094	Trembling Aspen	*Populus tremuloides*	Native	1	16			3.0	Improbable	Good	Remove	Curved stem; grapevine throughout canopy; healthy crown.
1095	Trembling Aspen	*Populus tremuloides*	Native	1	12			3.0	Improbable	Good	Remove	Leaning into clearing; minor defoliation; grapevine in canopy.
1096	Trembling Aspen	*Populus tremuloides*	Native	1	17			3.0	Improbable	Fair	Remove	Extensive grapevine in lower canopy; girdling root.
1097	Trembling Aspen	*Populus tremuloides*	Native	1	17			4.0	Improbable	Fair	Remove	Curved stem base; leans towards path; extensive grapevine growth.
1200	Trembling Aspen	*Populus tremuloides*	Native	1	15			3.5	Improbable	Poor	Remove	Necrotic leaves; sparse crown; defoliation.
1201	Sugar Maple	*Acer saccharum*	Native	1	41			5.5	Improbable	Good	Remove	Basal shoots from girdling root; eroding base from drainage and paved pathway; few epicormic shoots; healthy crown.
1203	Trembling Aspen	*Populus tremuloides*	Native	1	18			2.0	Possible	Dead	Remove	Extensive grapevine in canopy; bark partially intact.
1204	Trembling Aspen	*Populus tremuloides*	Native	1	15			3.0	Possible	Very Poor	Remove	No remaining live crown; basal shoots; extensive grapevine growth.
1205	Trembling Aspen	*Populus tremuloides*	Native	1	15			3.0	Possible	Poor	Remove	Fruiting bodies and fungal growth on bark; extensive grapevine in canopy; limited live growth.
1206	Trembling Aspen	*Populus tremuloides*	Native	1	15			3.0	Improbable	Fair	Remove	Limited but healthy crown; grapevine in canopy; some fungal growth on bark.
1207	Trembling Aspen	*Populus tremuloides*	Native	1	13			2.5	Improbable	Fair	Remove	Leaning west; weighed down by grapevine; limited canopy.
1208	Trembling Aspen	*Populus tremuloides*	Native	2	17	12		4.0	Improbable	Fair	Remove	Codominant stems joined at root flare; leaning west; 30% dieback in second leader.
1209	White Ash	*Fraxinus americana*	Native	1	29			5.0	Improbable	Fair	Remove	Full crown; no apparent dieback; leaves appear necrotic and defoliation along edges.
1210	Trembling Aspen	*Populus tremuloides*	Native	1	12			2.5	Improbable	Fair	Remove	Sparse, narrow crown; lower branch dieback.
1211	Trembling Aspen	*Populus tremuloides*	Native	1	14			2.5	Improbable	Fair	Remove	Minor defoliation; minor necrosis; slight lean west.
1212	Trembling Aspen	*Populus tremuloides*	Native	1	10			3.0	Improbable	Good	Remove	Minor defoliation; 40% dieback.
1213	White Ash	*Fraxinus americana*	Native	1	25			4.0	Possible	Very Poor	Remove	Possibly dead; unable to see top of canopy; very few if any leaves.
1214	Sugar Maple	*Acer saccharum*	Native	1	44			4.5	Improbable	Good	Remove	Minor leaf spotting; great structure..
1215	Common Pear	*Pyrus communis*	Non-native	2	40	21		5.0	Improbable	Fair	Remove	Few large dead branches; dead lower canopy due to sunlight suppression.
1216	Sugar Maple	*Acer saccharum*	Native	1	25			4.0	Improbable	Good	Remove	Lower crown suppression; phototrophic growth west; minor leaf spotting.
1217	Sugar Maple	*Acer saccharum*	Native	2	29	24		4.5	Possible	Good	Remove	Codominant stems; included bark; fused tissue; suppressed crown oriented west.
1218	Sugar Maple	*Acer saccharum*	Native	1	10			4.0	Improbable	Fair	Remove	Asymmetrical crown due to crowding; some epicormic growth.
1219	White Ash	*Fraxinus americana*	Native	1	31			3.0	Possible	Dead	Remove	Peeling bark; signs of EAB; no live crown.
1220	Sugar Maple	*Acer saccharum*	Native	1	34			4.5	Improbable	Good	Remove	Exposed roots from eroding base; healthy full crown.
1221	Sugar Maple	*Acer saccharum*	Native	1	21			5.0	Improbable	Fair	Remove	Some epicormic growth; few dead branches.
1222	White Ash	*Fraxinus americana*	Native	1	14			2.0	Possible	Very Poor	Remove	80% canopy dieback; basal shoots; curved base; bark splitting.
1223	Eastern White Cedar	*Thuja occidentalis*	Native	1	18			1.0	Possible	Dead	Remove	Snag; complete suppression; recently dead.
1224	Sugar Maple	*Acer saccharum*	Native	2	27	25		6.0	Improbable	Fair	Remove	Asymmetrical crown; two stems starting to morph together; some epicormic growth.

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1225	Sugar Maple	*Acer saccharum*	Native	1	23			4.0	Improbable	Good	Remove	Minor lower crown suppression; emerging second leader.
1226	Sugar Maple	*Acer saccharum*	Native	3	24	22	17	6.0	Improbable	Fair	Remove	Few dead branches; assymetrical crown due to limited sun.
1227	Sugar Maple	*Acer saccharum*	Native	1	19			3.5	Improbable	Good	Remove	Slight lean west; minor crown suppression.
1228	American Elm	*Ulmus americana*	Native	1	15			4.0	Possible	Poor	Remove	90 degree lateral curve of stem to east; epicormic shoots; basal shoots; defoliation.
1229	American Elm	*Ulmus americana*	Native	1	12			7.0	Possible	Poor	Remove	Trunk straight then completly leans up slope out of the hedgerow (west) ; very thin crown.
1230	Sugar Maple	*Acer saccharum*	Native	2	27	34		7.0	Possible	Fair	Remove	Few cankers on main stemas; larger stem sealing around smaller stem leaving large joining crack; few dead branches.
1231	Sugar Maple	*Acer saccharum*	Native	1	39			6.0	Improbable	Good	Remove	Exposed roots due to eroding base; healthy crown.
1232	American Elm	*Ulmus americana*	Native	1	11			3.0	Possible	Fair	Remove	Slight lean south; narrow crown; buttressed root.
1233	Sugar Maple	*Acer saccharum*	Native	1	23			5.0	Improbable	Fair	Remove	Thinner canopy; good root hold on slope.
1234	Sugar Maple	*Acer saccharum*	Native	1	21			4.0	Improbable	Good	Remove	Suppressed crown; slight lean west; minor lower branch dieback.
1235	Sugar Maple	*Acer saccharum*	Native	1	31			4.0	Improbable	Good	Remove	Healthy crown; great form; minor leaf spots; sapsucker damage.
1236	Sugar Maple	*Acer saccharum*	Native	1	26			6.0	Improbable	Fair	Remove	Assymetrical crown due to crowding; good full crown.
1237	Sugar Maple	*Acer saccharum*	Native	1	22			5.0	Improbable	Fair	Remove	Assymetrical crown due to crowding; some poor branch attachment.
1238	White Mulberry	*Morus alba*	Non-native	2	13	26		5.0	Possible	Fair	Remove	Very twisted trunk and limbs; numerous surface roots.
1239	White Mulberry	*Morus alba*	Non-native	1	32			7.0	Improbable	Fair	Remove	Twisted trunk; leaning west; few dead branches; thinner under canopy.
1240	Sugar Maple	*Acer saccharum*	Native	1	21			4.0	Improbable	Good	Remove	Slightly curved base; healthy crown; lower crown somewhat suppressed.
1241	Sugar Maple	*Acer saccharum*	Native	1	18			4.0	Improbable	Fair	Remove	Split stems just above DBH; poor attachment; stems leaning west towards golf course for sunlight.
1242	Sugar Maple	*Acer saccharum*	Native	1	36			6.0	Improbable	Good	Remove	Asymmetrical lower crown due east; exposed roots due to eroded base.
1243	American Elm	*Ulmus americana*	Native	1	18			5.5	Possible	Poor	Remove	90 degree lean of upper stem, to east; tissue fused with adjacent branch; epicormic shoots.
1244	Sugar Maple	*Acer saccharum*	Native	1	32			5.0	Improbable	Good	Remove	Asymmetrical crown due east; lower crown competing with adjacent shrubs and trees.
1245	Sugar Maple	*Acer saccharum*	Native	1	40			7.0	Improbable	Good	Remove	Exposed roots due to eroding base; healthy spreading crown.
1246	Sugar Maple	*Acer saccharum*	Native	1	28			5.0	Improbable	Good	Remove	Codominant upper leaders; some phototrophic branching; healthy crown.
1247	Sugar Maple	*Acer saccharum*	Native	2	13	11		5.0	Improbable	Fair	Remove	Assymetrical crown east; poor branch attachment; epicormic growth; lots of debris under canopy.
1248	Sugar Maple	*Acer saccharum*	Native	1	31			5.5	Improbable	Good	Remove	Asymmetrical, suppressed crown due east; curved phototrophic branches.
1249	Sugar Maple	*Acer saccharum*	Native	1	28			4.0	Improbable	Good	Remove	Suppressed crown; curving phototrophic stem.
1250	Sugar Maple	*Acer saccharum*	Native	1	11			#VALUE!	Improbable	Good	Remove	
1251	Sugar Maple	*Acer saccharum*	Native	1	15			5.0	Improbable	Fair	Remove	Assymetrical crown; some epicormic growth; smaller secondary stem; few dead branches.
1252	Sugar Maple	*Acer saccharum*	Native	1	27			8.0	Improbable	Fair	Remove	Thinner canopy; assymetrical going east; surface roots have a lot of fruiting bodies around them; few dead branches.
1253	Sugar Maple	*Acer saccharum*	Native	1	16			5.5	Improbable	Fair	Remove	Asymmetrical crown oriented east; epicormic shoots along stem; fruiting bodies near root flare.

Kettle Creek Golf Course
Tree Inventory Data

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH 1 (cm)	DBH 2 (cm)	DBH 3 (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Proposed Action	Comments
1254	Sugar Maple	*Acer saccharum*	Native	1	17			5.0	Improbable	Good	Remove	Healthy crown; minor epicormic shoots; potential suppression in canopy.
1255	Sugar Maple	*Acer saccharum*	Native	1	27			5.0	Improbable	Poor	Remove	Slightly asymmetrical; few dead branches; pistol butt.
1256	Sugar Maple	*Acer saccharum*	Native	1	13			3.5	Improbable	Good	Remove	Lower crown outcompeted by neighbouring shrubs; sealed stem wounds; slight phototrophic lean east.
1257	Common Apple	*Malus pumila*	Non-native	1	21			4.5	Possible	Poor	Remove	Fused branches; heavy upper lean east; poor attachment; epicormic shoots.
1258	Common Apple	*Malus pumila*	Non-native	1	18			5.0	Possible	Poor	Remove	Heavy lean east; epicormic shoots; lower branch dieback; leaf rust.
1259	Common Apple	*Malus pumila*	Non-native	1	13			4.0	Possible	Poor	Remove	Growing on lean east; numerous wounds sealing; epicormic growth; numerous dead branches; vines throughout.
1260	Sugar Maple	*Acer saccharum*	Native	1	50			7.0	Improbable	Fair	Remove	Good crown form.
1261	Sugar Maple	*Acer saccharum*	Native	1	31			5.0	Possible	Good	Remove	Pistol butt; vine growth in lower canopy; partially sealed root wounds; squirrel drey.
1262	Sugar Maple	*Acer saccharum*	Native	1	26			7.0	Improbable	Fair	Remove	Virginia creeper vines completely up tru k and into canopy; overall good form.
1263	Sugar Maple	*Acer saccharum*	Native	1	16			1.5	Possible	Dead	Remove	Large stem wounds; completely overrun by Virginia Creeper.
1264	Sugar Maple	*Acer saccharum*	Native	1	25			5.0	Improbable	Fair	Remove	Some poor attachment; double leader with strong attachment; few dead branches.
1265	Sugar Maple	*Acer saccharum*	Native	1	28			4.0	Improbable	Fair	Remove	Codominant upper leaders; stem wounds with possible bacterial ooze and staining; minor dieback in crown.
1266	Sugar Maple	*Acer saccharum*	Native	1	21			4.0	Improbable	Fair	Remove	Poor branch attachment; slight lean.
1267	Sugar Maple	*Acer saccharum*	Native	1	28			4.5	Improbable	Good	Remove	Crown somewhat suppressed; good attachment.
1268	Sugar Maple	*Acer saccharum*	Native	1	42			8.0	Improbable	Fair	Remove	Some twisted large branches; epicormic growth; few branches growing into one another.
1269	Sugar Maple	*Acer saccharum*	Native	1	23			5.0	Improbable	Fair	Remove	Suppressed crown; epicormic growth.
1270	Sugar Maple	*Acer saccharum*	Native	1	26			3.0	Improbable	Good	Remove	Upper crown curved eastward; lower branch dieback, likely from light suppression.
1271	Sugar Maple	*Acer saccharum*	Native	1	20			3.0	Improbable	Fair	Remove	Small crown due to lack of sun; numerous dead branches.
1272	Sugar Maple	*Acer saccharum*	Native	1	15			3.5	Improbable	Fair	Remove	Epicormic shoots; defoliation; leaf spots; suppressed crown.
1273	Sugar Maple	*Acer saccharum*	Native	1	18	16		5.0	Possible	Fair	Remove	Codominant leaders; included bark; root girdling; epicormic shoots; crown leaning south.
1274	Sugar Maple	*Acer saccharum*	Native	1	19			3.0	Improbable	Fair	Remove	Thin and small canopy due to crowding; epicormic growth.
1275	Sugar Maple	*Acer saccharum*	Native	1	24			5.0	Improbable	Fair	Remove	Some leaf wilt; defoliation; pistol butt; base suspended on eroding slope.
1276	Sugar Maple	*Acer saccharum*	Native	1	15			2.0	Improbable	Poor	Remove	Pistol butt; wilting leaves; epicormic growth; small crown.
1277	Sugar Maple	*Acer saccharum*	Native	1	22			4.0	Improbable	Good	Remove	Asymmetrical crown due south; somewhat suppressed; healthy foliage.
1278	American Elm	*Ulmus americana*	Native	1	27			5.0	Possible	Very Poor	Remove	Little to no canopy; bacterial sludge seeping from bark; staining; majority of large branches dead.
1279	Sugar Maple	*Acer saccharum*	Native	1	14			2.0	Improbable	Fair	Remove	Small crown due to crowding.
1280	Sugar Maple	*Acer saccharum*	Native	1	21			4.5	Improbable	Good	Remove	Curved base; slight lean west; suppressed crown.
1281	Eastern Cottonwood	*Populus deltoides*	Native	1	36			4.0	Improbable	Fair	Remove	Lower crown competition with adjacent sub-canopy trees; vine growth.

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Tree Inventory Data

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH 1 (cm)	DBH 2 (cm)	DBH 3 (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Proposed Action	Comments
1282	Large-toothed Aspen	*Populus grandidentata*	Native	1	21			4.0	Probable	Fair	Remove	Twisted trunk; few dead branches; epicormic growth; large would midway up trunk showing decay.
1283	Large-toothed Aspen	*Populus grandidentata*	Native	1	15			2.0	Probable	Poor	Remove	Very large decaying wound up trunk; large crack; small crown.
1284	Eastern Cottonwood	*Populus deltoides*	Native	2	43	19		4.5	Improbable	Good	Remove	Leaders joined at root flare; crown somewhat suppressed by adjacent trees; healthy foliage.
1285	Eastern Cottonwood	*Populus deltoides*	Native	1	17			3.0	Improbable	Fair	Remove	Thinner crown due to crowding; overall good few dead branches.
1286	Eastern Cottonwood	*Populus deltoides*	Native	1	30			6.0	Improbable	Fair	Remove	Good crown structure; stained crack approximately 1m long from base of the tree.
1287	Eastern Cottonwood	*Populus deltoides*	Native	1	32			4.0	Improbable	Good	Remove	Minor crown defoliation; minor lower branch dieback.
1288	Eastern Cottonwood	*Populus deltoides*	Native	1	15			2.5	Improbable	Fair	Remove	Minor lower branch dieback; sparse crown.
1289	Eastern Cottonwood	*Populus deltoides*	Native	1	29			5.0	Improbable	Fair	Remove	Covered in grape vine; only leaves in upper canopy.
1290	Eastern Cottonwood	*Populus deltoides*	Native	1	11			3.0	Possible	Fair	Remove	Pistol butt; weak attachment; dead basal leaders.
1291	Blue Spruce	*Picea pungens*	Non-native	1	17			2.0	Improbable	Fair	Remove	Slight thin crown; grape vine up trunk.
1292	White Fir	*Abies concolor*	Non-native	1	28			3.0	Improbable	Good	Remove	Grapevine through canopy; self-pruning.
1293	White Fir	*Abies concolor*	Non-native	1	26			3.5	Improbable	Good	Remove	Full, healthy crown; good form.
1294	White Fir	*Abies concolor*	Non-native	1	28			2.5	Improbable	Good	Remove	Full, healthy crown; good form.
1295	Sugar Maple	*Acer saccharum*	Native	2	27	13		7.0	Improbable	Poor	Remove	Two main stems(split after DBH) have poor attachment with staining; third stem from almost base of trunk; overall poor attachment.
1296	White Ash	*Fraxinus americana*	Native	1	47			5.0	Probable	Dead	Remove	Emerald ash borer; some bark intact; fruiting bodies at base.
1297	Sugar Maple	*Acer saccharum*	Native	1	18			5.0	Possible	Good	Remove	Pistol butt lateral branch with partially sealed wound, oriented east; suppressed crown.
1298	Sugar Maple	*Acer saccharum*	Native	1	10			4.0	Improbable	Fair	Remove	Suppressed asymmetrical crown.
1299	Sugar Maple	*Acer saccharum*	Native	1	46			5.5	Improbable	Good	Remove	Healthy, full crown; great form; good attachment.
1300	Sugar Maple	*Acer saccharum*	Native	1	13			3.0	Improbable	Good	Remove	Crown somewhat suppressed; curved base.
1301	Sugar Maple	*Acer saccharum*	Native	1	15			5.0	Improbable	Fair	Remove	Suppressed assymetrical crown; overall fair structure.
1302	Sugar Maple	*Acer saccharum*	Native	1	32			4.5	Improbable	Good	Remove	Girdling root; crown oriented east.
1303	Sugar Maple	*Acer saccharum*	Native	1	15			2.0	Imminent	Dead	Remove	Fruiting bodies at base; bark completely peeled off; only main branches remain.
1304	Sugar Maple	*Acer saccharum*	Native	1	12			4.0	Improbable	Fair	Remove	Assymetrical crown; few dead branches.
1305	Sugar Maple	*Acer saccharum*	Native	1	29			5.5	Improbable	Good	Remove	Brush piled around base; codominant leaders; lower branch dieback.
1306	Sugar Maple	*Acer saccharum*	Native	1	30			6.0	Improbable	Good	Remove	Asymmetrical crown due east; crown overhanging building; sapsucker holes.
1307	Sugar Maple	*Acer saccharum*	Native	1	24			7.0	Probable	Very Poor	Remove	Numerous types of fruiting bodies at base; cavities; large rotting patch at base; peeling bark; one branch still has full canopy, otherwise dead.
1308	Sugar Maple	*Acer saccharum*	Native	1	47			7.0	Possible	Good	Remove	Asymmetrical crown due east; overhanging building; girdling root; large, twisted, sealed trunk fissure.
1309	Sugar Maple	*Acer saccharum*	Native	2	13	11		6.0	Improbable	Fair	Remove	Epicormic growth; twisted branches; suppressed crown.
1310	Sugar Maple	*Acer saccharum*	Native	1	24			4.0	Improbable	Good	Remove	Fused roots; suppressed crown; 5% dieback.
1311	Sugar Maple	*Acer saccharum*	Native	1	40			6.0	Possible	Good	Remove	Girdling roots; codominant leaders; branches overhanging building.
1312	White Mulberry	*Morus alba*	Non-native	1	36			4.0	Probable	Poor	Remove	Historical branch failure; broken structural branch; basal wound with ooze; curved base.
1313	White Mulberry	*Morus alba*	Non-native	1	34	16		4.0	Probable	Poor	Remove	Major historical branch failure; stem cavity and fissures; bacterial ooze; included bark; poor attachment.
1314	Black Walnut	*Juglans nigra*	Native	1	30			7.0	Improbable	Fair	Remove	Slightly assymetrical crown; few dead branches; debris within canopy area.

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Tree Inventory Data

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH 1 (cm)	DBH 2 (cm)	DBH 3 (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Proposed Action	Comments
1315	Sugar Maple	*Acer saccharum*	Native	1	10			2.5	Improbable	Good	Remove	Narrow, suppressed crown; grapevine in canopy.
1316	Sweet Cherry	*Prunus avium*	Non-native	1	13			2.0	Improbable	Fair	Remove	Suppressed crown; slight lean.
1317	Sugar Maple	*Acer saccharum*	Native	1	12			2.5	Improbable	Good	Remove	Emerging second upper leader; canopy suppression; phototrophic orientation east.
1318	Manitoba Maple	*Acer negundo*	Native	2	13	24		7.0	Improbable	Fair	Remove	Leaning east; debris underneath crown; poor branch attachment.
1319	White Ash	*Fraxinus americana*	Native	1	26			4.0	Possible	Fair	Remove	Codominant upper leaders; sealed trunk wounds; minor bark splitting; healthy canopy; early stage EAB infestation.
1320	Sugar Maple	*Acer saccharum*	Native	1	13			6.0	Improbable	Fair	Remove	Growing next to wearhouse; assymetrical crown east; few dead branches.
1321	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	26			5.0	Improbable	Fair	Retain	Large trunk fissure, partially sealed; lower branch dieback; codominant upper leaders; included bark.
1322	Eastern Cottonwood	*Populus deltoides*	Native	1	40			5.5	Possible	Good	Prune	Codominant upper leaders; spreading crown overhanging structure; epicormic shoots.
1323	Eastern Cottonwood	*Populus deltoides*	Native	2	27	24		4.0	Improbable	Fair	Retain	Dead branches in lower canopy; multiple leaders; epicormic growth.
1324	Norway Maple	*Acer platanoides*	Non-native	1	33			6.0	Improbable	Fair	Retain	Mechanical damage to surface roots; poor branch attachment.
1325	Norway Maple	*Acer platanoides*	Non-native	1	23			4.5	Possible	Fair	Retain	Mower damage at root flare; stem fissures; stem girdling from wires; historical branch failures.
1326	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	32			8.0	Improbable	Fair	Retain	Growing on strong lean west; evidence of branch failures and pruning; epicormic growth.
1327	Norway Maple	*Acer platanoides*	Non-native	1	39			5.0	Improbable	Good	Retain	Mechanicals wounds on lower branches; mower damage to roots; healthy crown.
1328	White Spruce	*Picea glauca*	Native	1	20			3.0	Improbable	Very Poor	Retain	Very little live branches; extreme dieback.
1329	Norway Maple	*Acer platanoides*	Non-native	1	29			5.0	Possible	Good	Prune	Mechanical wounds to lower branches may result in failure; healthy crown; minor dieback; mower damage to root flare.
1330	White Spruce	*Picea glauca*	Native	1	20			2.0	Improbable	Very Poor	Retain	Excessive dieback; majority of branches without foliage.
1331	Norway Spruce	*Picea abies*	Non-native	1	28			4.0	Improbable	Good	Remove	Healthy crown; low lying branches; good form.
1332	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	24			6.0	Improbable	Fair	Remove	Numerous dead branches; slight curve in trunk.
1333	Black Walnut	*Juglans nigra*	Native	3	16	15	11	4.5	Improbable	Fair	Remove	Minor defoliation; multiple codominant stems; minor necrosis.
1334	Black Walnut	*Juglans nigra*	Native	2	14	14		4.0	Improbable	Fair	Retain	Good crown structure; few dead branches.
1335	Black Walnut	*Juglans nigra*	Native	1	24			6.0	Improbable	Fair	Retain	Good crown structure; few dead branches.
1336	Eastern Cottonwood	*Populus deltoides*	Native	1	81			8.0	Possible	Good	Retain	Stem growing on raised mound adjacent to road; eroding base; root damage from road paving and removal of neighbouring tree; 10% dieback.
1337	Blue Spruce	*Picea pungens*	Non-native	1	29			2.5	Improbable	Fair	Remove	Dieback ; evidence of pruning; thinner crown.
1338	Blue Spruce	*Picea pungens*	Non-native	1	21			1.0	Improbable	Fair	Remove	Some dieback; overall good form.
1339	Japanese Maple	*Acer japonicum*	Non-native	2	12	10		3.0	Improbable	Good	Remove	Good form; healthy crown.
1340	Bradford Pear	*Pyrus calleryana*	Non-native	1	14			1.0	Improbable	Good	Remove	Good condition; maintained.
1341	Chanticleer Pear	*Pyrus calleryana 'Chanticleer'*	Non-native	1	13			2.0	Improbable	Fair	Remove	Basal shoots indicative of stress; no apparent crown dieback.
1342	Bradford Pear	*Pyrus calleryana*	Non-native	1	14			1.0	Improbable	Good	Remove	Good condition; maintained.
1343	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	39			6.0	Improbable	Fair	Remove	Dead branches in undercanapy; overall good form.
1344	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	24			3.5	Improbable	Fair	Remove	Asymmetrical crown due east; lower branch dieback from light stress.
1345	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	30			6.0	Improbable	Fair	Remove	Dead branches in undercanapy; overall good form.

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Tree Inventory Data

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH 1 (cm)	DBH 2 (cm)	DBH 3 (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Proposed Action	Comments
1346	Blue Spruce	*Picea pungens*	Non-native	1	23			2.0	Improbable	Fair	Remove	Minor needle browning; grapevine in canopy; canopy suppression.
1347	Blue Spruce	*Picea pungens*	Non-native	1	22			1.0	Improbable	Fair	Remove	Extreme dieback; numerous dead branches.
1348	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	28			7.0	Improbable	Fair	Remove	Few dead branches; overall good form.
1349	White Ash	*Fraxinus americana*	Native	1	30			4.0	Possible	Very Poor	Remove	Live growth limited to basal shoots; bark mostly intact; EAB.
1350	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	38			7.0	Improbable	Fair	Remove	Few dead branches; overall good form
1351	Blue Spruce	*Picea pungens*	Non-native	1	22			2.5	Improbable	Good	Remove	Codominant stems; included bark; minor canopy suppression.
1352	Blue Spruce	*Picea pungens*	Non-native	1	30			3.0	Improbable	Poor	Remove	Extreme dieback; very few needles on branches.
1353	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	34			5.0	Improbable	Fair	Remove	Mower damage to root flare; 10% dieback.
1354	Green Ash	*Fraxinus pennsylvanica*	Native	1	38			5.0	Improbable	Fair	Remove	Peeling bark; basal shoots and epicormic growth are main growth; main branches dead; evidence of EAB.
1355	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	36			5.5	Improbable	Fair	Remove	Mower damage to root flare and exposed roots; 10% dieback; asymmetrical crown due west
1356	Blue Spruce	*Picea pungens*	Non-native	1	23			3.0	Improbable	Good	Remove	Dirt mounded at base; crown suppressed and oriented to west.
1357	Little-leaf Linden	*Tilia cordata*	Non-native	1	39			6.0	Improbable	Fair	Remove	Basal shoots; good form.
1358	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	37			6.5	Improbable	Good	Remove	Full, healthy crown; lower branch dieback due to light stress.
1359	Blue Spruce	*Picea pungens*	Non-native	1	16			2.5	Improbable	Fair	Remove	Suppressed crown; needle dieback.
1360	Blue Spruce	*Picea pungens*	Non-native	1	27			2.0	Improbable	Poor	Retain	Suppressed crown; aggressive dieback.
1361	Little-leaf Linden	*Tilia cordata*	Non-native	1	35			4.5	Improbable	Fair	Retain	Epicormic shoots; vigorous basal shoots; some defoliation; raised crown.
1362	Blue Spruce	*Picea pungens*	Non-native	1	25			2.0	Improbable	Fair	Remove	Assymetrical growth southwest due to adjacent trees; light pruning; minor dieback of lower branches.
1363	Blue Spruce	*Picea pungens*	Non-native	1	20			2.0	Improbable	Fair	Remove	Shade pruning due to position in hedgerow causing defoliation of lower crown.
1364	Little-leaf Linden	*Tilia cordata*	Non-native	1	33			3.5	Improbable	Fair	Remove	Codominant stems with included bark; assymetrical growth and slight lean south; many small epicormic shoots at base.
1365	Amur Maple	*Acer ginnala*	Non-native	7	11	11	11	4.0	Improbable	Good	Retain	Multiple codominant stems with lean, minor epicormic growth,.
1366	Amur Maple	*Acer ginnala*	Non-native	2	15	14		5.0	Improbable	Good	Remove	Root wounds; codominant stems; included bark; crown oriented north; burn marks on stem.
1367	Amur Maple	*Acer ginnala*	Non-native	1	20			4.0	Improbable	Fair	Remove	Epicormic shoots; swollen base; minor crown dieback; stem wounds.
1368	Blue Spruce	*Picea pungens*	Non-native	1	30			2.0	Improbable	Fair	Remove	Assymetrical growth south due to adjacent trees; light pruning; minor dieback of lower branches.
1369	Amur Maple	*Acer ginnala*	Non-native	3	22	17	13	5.0	Improbable	Good	Remove	Multiple codominant stems, crown leans significantly north, phototrophic growth, minor girdling roots.
1370	Amur Maple	*Acer ginnala*	Non-native	5	21	15	12	4.5	Possible	Poor	Remove	Multiple codominant stems joined at base; epicormic shoots; asymmetrical crown oriented north; fused stems.
1371	Blue Spruce	*Picea pungens*	Non-native	1	20			2.0	Improbable	Fair	Remove	Assymetrical growth south due to adjacent trees; light pruning; minor dieback of lower branches.
1372	Little-leaf Linden	*Tilia cordata*	Non-native	1	40			5.0	Improbable	Good	Remove	Leans slightly east, codominant leaders with included bark.
1373	Blue Spruce	*Picea pungens*	Non-native	1	30			3.0	Improbable	Good	Remove	Asymmetrical crown oriented south; limited live crown due to light stress; crown suppression.

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Tree Inventory Data

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH 1 (cm)	DBH 2 (cm)	DBH 3 (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Proposed Action	Comments
1374	Norway Maple	*Acer platanoides*	Non-native	1	48			4.0	Improbable	Fair	Remove	Exposed roots with mechanical damage; some decay at base; codominant leaders with included bark.
1375	Blue Spruce	*Picea pungens*	Non-native	1	16			2.0	Improbable	Good	Remove	Minor defoliation due to competition for sunlight, excess cone production.
1376	Little-leaf Linden	*Tilia cordata*	Non-native	1	36			3.0	Improbable	Fair	Remove	Slight lean south; exposed roots with minor mechanical damage; good form.
1377	Blue Spruce	*Picea pungens*	Non-native	1	26			3.0	Improbable	Good	Remove	Slight lean south, minor shade pruning.
1378	Little-leaf Linden	*Tilia cordata*	Non-native	1	28			2.5	Improbable	Good	Remove	Phototrophic branches; asymmetrical crown due west due to competition with adjacent trees; trunk growing on slope.
1379	Little-leaf Linden	*Tilia cordata*	Non-native	1	19			2.0	Improbable	Poor	Remove	Cavity through base of stem with frass, minor epicormic growth,insect damage to leaves (beetles feeding).
1380	Norway Spruce	*Picea abies*	Non-native	1	35			4.5	Improbable	Good	Remove	Asymmetrical crown due east due to canopy suppression; competing shrub growth within lower canopy.
1381	Little-leaf Linden	*Tilia cordata*	Non-native	1	35			3.0	Improbable	Fair	Remove	Codominant leaders with included bark; basal shoots; insect defoliation; previous pruning of lower branches.
1382	Norway Maple	*Acer platanoides*	Non-native	1	34			5.0	Improbable	Good	Remove	Codominant leaders with u-shaped union, slightly uneven crown.
1383	Norway Spruce	*Picea abies*	Non-native	1	40			5.0	Improbable	Good	Remove	Crown suppression from adjacent tree; minor shrub growth.
1384	Norway Spruce	*Picea abies*	Non-native	1	30			2.0	Improbable	Good	Remove	Full, dense crown with no obvious defects.
1385	Little-leaf Linden	*Tilia cordata*	Non-native	1	41			4.5	Possible	Fair	Remove	Girdled base from mower damage; extensive defoliation and necrosis at crown tips.
1386	Norway Spruce	*Picea abies*	Non-native	1	45			3.0	Improbable	Fair	Remove	Gumosis; minor dieback of lower branches.
1387	Blue Spruce	*Picea pungens*	Non-native	1	25			2.5	Improbable	Poor	Remove	Lower half of crown dead, small secondary vertical branch.
1388	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	38			6.0	Improbable	Good	Remove	Stem leans slightly east, codominant leaders, wide crown.
1389	Norway Spruce	*Picea abies*	Non-native	1	30			2.5	Improbable	Fair	Remove	Gumosis; exposed roots with mechanical damage; minor dieback.
1390	Blue Spruce	*Picea pungens*	Non-native	1	27			2.5	Improbable	Good	Remove	Mower damage to roots; full crown; self-pruning.
1391	Norway Maple	*Acer platanoides*	Non-native	1	21			2.0	Improbable	Fair	Remove	Seam crack down stem with some compartmentalization; LDD egg sacs; previous pruning of small lower branches.
1392	Blue Spruce	*Picea pungens*	Non-native	1	33			3.0	Possible	Fair	Remove	50% of canopy covered by grapevine; self-pruning.
1393	Blue Spruce	*Picea pungens*	Non-native	1	13			2.0	Improbable	Fair	Remove	Stunted growth form, leans slightly west, some defoliation of lower and inner branches.
1394	Norway Spruce	*Picea abies*	Non-native	1	45			4.5	Improbable	Good	Remove	Few overextended branches; minor grapevine in canopy; good form.
1395	Little-leaf Linden	*Tilia cordata*	Non-native	1	36			4.0	Improbable	Fair	Remove	Significant insect damage due to beetles feeding on leaves, minor epicormic growth, leans south.
1396	Little-leaf Linden	*Tilia cordata*	Non-native	1	42			5.0	Possible	Poor	Remove	Root girdling; vigorous basal shoots; extensive defoliation by Japanese Jewel Beetle resulting in skeletal crown.
1397	Blue Spruce	*Picea pungens*	Non-native	1	20			3.0	Improbable	Fair	Remove	Defoliation of lower and inner branches, several small vertical branches.
1398	Norway Spruce	*Picea abies*	Non-native	1	40			2.5	Improbable	Good	Remove	Minor dieback in lower stems.
1399	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	25			4.5	Possible	Fair	Remove	Swollen base due to mower damage; basal shoots; healthy crown; some weak attachment.
1400	Blue Spruce	*Picea pungens*	Non-native	1	34			3.0	Improbable	Fair	Remove	Defoliation of lower and inner branches, vine entering canopy.
1401	Norway Spruce	*Picea abies*	Non-native	1	40			2.5	Improbable	Good	Remove	Good form; minor dieback of lower branches.

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Tree Inventory Data

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1402	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	35			6.5	Possible	Good	Remove	Mower damage to root flare; slight lean east; sprawling crown.
1403	Blue Spruce	*Picea pungens*	Non-native	1	25			2.0	Improbable	Good	Remove	Minor shade pruning, beetles present on foliage.
1404	Norway Spruce	*Picea abies*	Non-native	1	40			3.0	Improbable	Fair	Remove	Gumosis; dieback of lower branches.
1405	Common Hackberry	*Celtis occidentalis*	Native	1	25			4.5	Possible	Fair	Remove	Girdling root; 10% canopy dieback; Hackberry Nipple Gall.
1406	Blue Spruce	*Picea pungens*	Non-native	1	35			1.5	Improbable	Fair	Remove	Dieback in lower half of branches; exposed roots with mechanical damage.
1407	Blue Spruce	*Picea pungens*	Non-native	1	25			2.0	Improbable	Poor	Remove	66% defoliation, lower half of crown previously removed.
1408	Norway Spruce	*Picea abies*	Non-native	1	28			4.0	Improbable	Fair	Retain	Few torn branches; resin seepage; crown somewhat suppressed.
1409	Blue Spruce	*Picea pungens*	Non-native	1	24			1.0	Possible	Very Poor	Remove	90% dieback of crown; previous pruning of lower third of branches; epicormic growth.
1410	Blue Spruce	*Picea pungens*	Non-native	1	23			3.0	Improbable	Fair	Remove	Self-pruning; crown somewhat sparse; crowded foliage.
1411	Norway Spruce	*Picea abies*	Non-native	1	45			3.5	Improbable	Fair	Remove	Gumosis; some dieback of lower branches.
1412	Blue Spruce	*Picea pungens*	Non-native	1	21			1.0	Improbable	Poor	Remove	Major defoliation, foliage browning, beetles present.
1413	Sweet Cherry	*Prunus avium*	Non-native	3	15	15	14	2.5	Possible	Poor	Remove	Several stem fissures; wounds and decay at root flare from mower damage; fruiting bodies and ants in stem wound; 20% canopy dieback.
1414	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	39			5.0	Improbable	Good	Remove	Codominant leaders with wide union, wide crown.
1415	Blue Spruce	*Picea pungens*	Non-native	1	25			2.0	Improbable	Fair	Remove	Minor dieback in lower half of crown.
1416	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	38			4.0	Improbable	Good	Remove	Few lowermost branches dead and could be removed, full, wide crown remaining.
1417	Blue Spruce	*Picea pungens*	Non-native	1	30			3.0	Improbable	Good	Remove	Few branch wounds; otherwise full, healthy crown; codominant leaders; included bark.
1418	Norway Spruce	*Picea abies*	Non-native	1	35			2.5	Improbable	Fair	Remove	Gumosis; dieback of lower branches.
1419	Little-leaf Linden	*Tilia cordata*	Non-native	1	47			3.5	Improbable	Good	Remove	Stem leans outh but crown self-corrects, sapsucker damage, insect damage to foliage with beetles present throughout.
1420	Norway Spruce	*Picea abies*	Non-native	1	28			4.5	Improbable	Good	Remove	Overextended, low-lying branches; resin seepage.
1421	Little-leaf Linden	*Tilia cordata*	Non-native	1	39			4.5	Possible	Fair	Remove	Defoliation by Japanese Jewel Beetle; leans south; mower damage to roots; leaf spots.
1422	Little-leaf Linden	*Tilia cordata*	Non-native	1	29			2.0	Possible	Fair	Remove	Stem leaning southeast; reaction wood; exposed roots with mechanical damage; basal shoots; major insect defoliation.
1423	Blue Spruce	*Picea pungens*	Non-native	1	23			2.5	Improbable	Good	Remove	Minor shade pruning, good form.
1424	Blue Spruce	*Picea pungens*	Non-native	1	35			3.0	Possible	Fair	Remove	Bittersweet Nightshade growing in lower canopy; pistol butt structural branch; multiple upper leaders; included bark.
1425	Little-leaf Linden	*Tilia cordata*	Non-native	1	45			2.5	Improbable	Fair	Remove	Exposed roots with mechanical damage; basal shoots; previous pruning of lower branches; some insect defoliation.
1426	Blue Spruce	*Picea pungens*	Non-native	1	21			2.0	Improbable	Good	Remove	Shade pruning of lower branches on north side full crown remains.
1427	Norway Spruce	*Picea abies*	Non-native	1	60			6.0	Improbable	Good	Remove	Great form; healthy crown; good attachment; low-lying branches.
1428	Little-leaf Linden	*Tilia cordata*	Non-native	1	43			5.0	Improbable	Fair	Remove	Girdling root with mower damage; defoliation by Japanese Jewel Beetle; raised crown; few points of weak attachment.
1429	Blue Spruce	*Picea pungens*	Non-native	1	25			2.0	Improbable	Fair	Remove	Some dieback throughout lower half of crown.
1430	Blue Spruce	*Picea pungens*	Non-native	1	20			2.0	Improbable	Good	Remove	Slight lean to south self-corrects, full crow.

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1431	Little-leaf Linden	*Tilia cordata*	Non-native	1	44			5.5	Possible	Fair	Remove	Basal shoots; nail gall; basal shoots; defoliation; pistol butt structural branch with mechanical wound; bird box.
1433	Blue Spruce	*Picea pungens*	Non-native	1	21			2.0	Improbable	Good	Remove	Codominant leaders at 3m, minor shade pruning.
1434	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	34			4.0	Improbable	Fair	Remove	Codominant leaders with included bark; minor dieback of lower branches; previous pruning of lower branches.
1435	Blue Spruce	*Picea pungens*	Non-native	1	30			3.0	Improbable	Fair	Remove	Sparse crown; minor needle browning; asymmetrical crown suppressed by adjacent tree.
1436	Blue Spruce	*Picea pungens*	Non-native	1	25			3.5	Improbable	Fair	Remove	Self-pruning; sparse crown; yellowing needles.
1437	Blue Spruce	*Picea pungens*	Non-native	1	30			2.0	Improbable	Fair	Remove	Some dieback throughout lower half of crown.
1438	Blue Spruce	*Picea pungens*	Non-native	1	31			3.0	Improbable	Poor	Remove	Significant defoliation with top of crown and some branches alive, competition for sunlight.
1439	Little-leaf Linden	*Tilia cordata*	Non-native	1	37			4.5	Possible	Fair	Retain	Girdling roots; raised crown; sealed trunk fissure; basal shoots; defoliation from Japanese Jewel Beetle.
1440	Blue Spruce	*Picea pungens*	Non-native	1	25			1.5	Improbable	Fair	Retain	Assymetrical growth south due to adjacent trees; light pruning; stem leaning slightly east; exposed roots with mechanical damage.
1441	Norway Spruce	*Picea abies*	Non-native	1	60			4.5	Improbable	Good	Retain	Low-lying branches; full healthy crown; good form.
1442	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	23			4.0	Improbable	Fair	Retain	Codominant leaders with included bark; assymetrical growth north due to adjacent trees; basal wound with compartmentalization; minor dieback of lower branches.
1443	Norway Spruce	*Picea abies*	Non-native	1	54			4.5	Improbable	Good	Retain	Low-lying branches; healthy crown; minor suppression from neighboring tree.
1444	Blue Spruce	*Picea pungens*	Non-native	1	28			3.0	Improbable	Fair	Retain	Raised crown on eastern side; codominant leaders; torn branches on eastern side.
1445	Little-leaf Linden	*Tilia cordata*	Non-native	1	38			4.0	Improbable	Good	Retain	Epicormic shoots at root flare, codominant leaders with included bark.
1446	Norway Spruce	*Picea abies*	Non-native	1	40			3.5	Improbable	Fair	Retain	Assymetrical growth south due to adjacent tree; exposed roots with mechanical damage; light pruning.
1447	Little-leaf Linden	*Tilia cordata*	Non-native	1	46			5.0	Improbable	Good	Retain	Dense crown, codominant leaders, no other obvious defects.
1448	Eastern Cottonwood	*Populus deltoides*	Native	1	89			10.0	Improbable	Good	Retain	Codominant leaders with included bark; exposed roots with mechanical damage.
1449	Black Walnut	*Juglans nigra*	Native	1	32			4.0	Improbable	Good	Retain	Slightly uneven crown due to competition for sunlight.
1450	Green Ash	*Fraxinus pennsylvanica*	Native	7	25	23	19	4.0	Improbable	Good	Retain	Codominant stems but growing tightly, minor frost cracks.
1451	Black Walnut	*Juglans nigra*	Native	1	36			8.0	Improbable	Fair	Retain	Assymetrical growth north due to adjacent trees; codominant leaders with included bark; minor dieback of lower branches.
1452	Eastern Cottonwood	*Populus deltoides*	Native	1	85			8.0	Possible	Good	Prune	Large sprawling crown; few phototrophic branches; few points of weak attachment; minor sealed wounds on stem.
1453	Blue Spruce	*Picea pungens*	Non-native	1	22			1.0	Possible	Poor	Retain	Major dieback, only top of crown and few branch ends alive.
1454	Green Ash	*Fraxinus pennsylvanica*	Native	1	25			2.0	Possible	Very Poor	Retain	Main stem dead; smaller stem less than 10cm DBH alive.
1455	Blue Spruce	*Picea pungens*	Non-native	1	28			3.5	Improbable	Fair	Retain	Western side of crown suppressed by adjacent tree; raised crown; minor vine growth.
1456	Willow sp.	*Salix sp.*	Native	2	43	41		5.0	Improbable	Good	Retain	Codominant stems with included bark, minor epicormic growth, full crow .
1457	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	37			6.0	Improbable	Fair	Retain	Assymetrical growth east due to adjacent trees; codominant leaders with included bark; some dieback of lower branches.

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1458	Norway Spruce	*Picea abies*	Non-native	1	45			6.0	Improbable	Fair	Retain	Minor mower damage to roots; crown suppressed by adjacent trees.
1459	Norway Maple	*Acer platanoides*	Non-native	1	42			5.5	Possible	Fair	Retain	Twisted and fused structural branches; minor twig dieback; grapevine.
1460	Blue Spruce	*Picea pungens*	Non-native	1	20			1.5	Improbable	Fair	Retain	Grapevine throughout upper canopy, some shade pruning.
1461	Blue Spruce	*Picea pungens*	Non-native	1	20			1.5	Improbable	Fair	Retain	Assymetrical growth south due to adjacent tree; light pruning; vines throughout crown.
1462	Little-leaf Linden	*Tilia cordata*	Non-native	1	39			4.0	Improbable	Good	Retain	Very minor cavities due to improper pruning cuts, minor included bark.
1463	Norway Spruce	*Picea abies*	Non-native	1	52			4.5	Improbable	Good	Retain	Crown suppressed to south due to competition with adjacent tree; some historical pruning.
1464	Little-leaf Linden	*Tilia cordata*	Non-native	1	40			2.5	Improbable	Fair	Retain	Assymetrical growth south due to adjacent tree; codominant leaders with included bar; vines throughout crown; minor insect defoliation; basal shoots less than 10cm DBH.
1465	Black Walnut	*Juglans nigra*	Native	1	28			3.5	Possible	Fair	Retain	Codominant stems; swollen included bark; sealed stem wounds; asymmetrical crown due north.
1466	Black Walnut	*Juglans nigra*	Native	2	18	20		4.0	Improbable	Good	Retain	Codominant stems with included bark, stems rub slightly, grapevine entering canopy.
1467	Black Walnut	*Juglans nigra*	Native	1	40			4.0	Improbable	Good	Retain	Small wound with callous on stem, growing on edge of bank.
1468	Black Walnut	*Juglans nigra*	Native	1	144			10.5	Possible	Fair	Retain	Weak attachment of structural branch; 15% dieback; historical failure.
1469	Eastern White Pine	*Pinus strobus*	Native	1	47			5.5	Improbable	Good	Remove	Raised crown; codominant leaders; included bark.
1470	Little-leaf Linden	*Tilia cordata*	Non-native	1	36			4.0	Improbable	Good	Remove	Minor epicormic growth, slight lean self-corrects.
1471	Little-leaf Linden	*Tilia cordata*	Non-native	1	40			3.0	Improbable	Fair	Remove	Basal shoots; minor insect defoliation; exposed roots with mechanical damage.
1472	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	34			5.0	Probable	Fair	Remove	Hanger from recently broken branch; codominant leaders with included bark; some lower branches dead.
1473	Little-leaf Linden	*Tilia cordata*	Non-native	1	1473			4.0	Improbable	Good	Remove	Minor insect damage, beetles present, codominant leaders with included bark.
1474	Eastern White Pine	*Pinus strobus*	Native	3	39	27	17	5.5	Possible	Good	Remove	Central stem with large, upwards-oriented lateral branches; codominant leaders; historical failure.
1475	Eastern White Pine	*Pinus strobus*	Native	1	39			4.0	Improbable	Good	Remove	Small girdling root, several secondary vertical branches.
1476	Little-leaf Linden	*Tilia cordata*	Non-native	1	42			4.0	Improbable	Fair	Remove	Codominant leaders with included bark; some insect defoliation.
1477	Little-leaf Linden	*Tilia cordata*	Non-native	1	40			4.5	Improbable	Good	Remove	Calloused previous wound likely from mower, slight lean towards south.
1478	Eastern White Pine	*Pinus strobus*	Native	3	33			4.0	Improbable	Fair	Remove	Swollen root flare from mower damage; raised crown; suppressed on south side.
1479	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	25			5.0	Improbable	Fair	Remove	Codominant leaders with included bark; dieback of lower branches.
1480	White Spruce	*Picea glauca*	Native	3	29			4.0	Improbable	Good	Remove	Decurrent form; minor vine growth.
1481	Blue Spruce	*Picea pungens*	Non-native	1	30			2.0	Improbable	Good	Remove	Minor shade pruning on one side, leader slightly out of line with stem.
1482	White Spruce	*Picea glauca*	Native	1	25			2.0	Possible	Poor	Remove	Dieback throughout lower half of crown; poor vigour.
1483	Little-leaf Linden	*Tilia cordata*	Non-native	1	17			2.0	Possible	Very Poor	Remove	Major dieback, insect damage with beetles present, leader dead, history of pruning to remove dead branches.
1484	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	28			7.5	Improbable	Good	Remove	Slight lean west; mower damage to exposed roots; bark staining around sealed fissure.
1485	Blue Spruce	*Picea pungens*	Non-native	1	18			1.0	Improbable	Fair	Remove	Growing immediately adjacent to small mulberry, minor dieback.

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1486	Blue Spruce	*Picea pungens*	Non-native	1	38			2.0	Improbable	Fair	Remove	Some yellowing needles; self-pruning.
1487	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	35			3.5	Improbable	Fair	Remove	Codominant leaders with included bark; minor dieback of lower branches.
1488	White Spruce	*Picea glauca*	Native	1	26			3.0	Improbable	Good	Remove	Heavy seed crop; full crown; minor dieback.
1489	Blue Spruce	*Picea pungens*	Non-native	1	29			2.0	Improbable	Good	Remove	Codominant leaders at 1m, minor shade pruning in lower branches, but full crown.
1490	Norway Spruce	*Picea abies*	Non-native	1	35			2.5	Improbable	Good	Remove	No visible defects; good vigour.
1491	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	28			4.0	Improbable	Fair	Remove	Wounds and swelling at root flare due to mower damage; historical pruning; minor twig dieback.
1492	Norway Spruce	*Picea abies*	Non-native	1	36			3.0	Improbable	Good	Remove	Leader out of line with stem, minor shade pruning.
1493	Blue Spruce	*Picea pungens*	Non-native	1	25			2.5	Improbable	Fair	Remove	Asymmetrical crown; west side suppressed by neighboring tree.
1494	Common Hackberry	*Celtis occidentalis*	Native	1	37			4.0	Improbable	Fair	Remove	Exposed roots with mechanical damage; minor dieback of lower branches; minor insect defoliation.
1495	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	23			3.0	Possible	Fair	Remove	Large, swollen root flare from mower damage; wounds on exposed roots; dieback of lower branches; codominant leaders; included bark.
1496	Norway Spruce	*Picea abies*	Non-native	1	40			5.0	Improbable	Fair	Remove	Top of main stem broken off; secondary vertical leaders; minor dieback.
1497	Balsam Fir	*Abies balsamea*	Native	1	23			1.0	Improbable	Fair	Retain	Mower damage to root flare and stem, lower branches pruned, minor dieback.
1498	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	23			4.5	Improbable	Fair	Remove	Wounds to root flare from mower damage; minor lower branch dieback.
1499	Freeman's Maple	*Acer x freemanii*	Native	1	34			4.5	Improbable	Good	Remove	Some crowded branching; fused leaders; wounded girdling root.
1500	Maiden-hair Tree	*Ginkgo biloba*	Non-native	1	22			1.5	Improbable	Fair	Remove	Codominant leaders with included bark; good vigour.
1701	Red Maple	*Acer rubrum*	Native	1	12			2.0	Possible	Good	Remove	Wounds at root flare; stem wound; minor lead rust.
1702	Norway Spruce	*Picea abies*	Non-native	1	30			3.0	Improbable	Good	Remove	Exuding sap in a few small areas.
1703	Sugar Maple	*Acer saccharum*	Native	1	16			3.0	Possible	Fair	Remove	Wounds at root flare from mower damage; large basal wounds, partially sealed; minor twig dieback; defoliation from Japanese Jewel Beetle.
1704	Norway Maple	*Acer platanoides*	Non-native	1	41			4.0	Improbable	Good	Remove	Mower damage to exposed roots, minor insect damage with beetles present on leaves.
1705	Blue Spruce	*Picea pungens*	Non-native	1	25			1.5	Improbable	Fair	Remove	Exposed root with mechanical damage; some dieback in lower crown.
1706	Blue Spruce	*Picea pungens*	Non-native	1	28			2.5	Improbable	Fair	Remove	Live crown limited due to suppression on east and west sides.
1707	Norway Maple	*Acer platanoides*	Non-native	1	37			5.0	Improbable	Good	Remove	Minor mower damage to exposed roots, minor included bark.
1708	White Spruce	*Picea glauca*	Native	1	24			3.0	Possible	Good	Remove	Historical stem girdling; resin seepage; somewhat sparse crown.
1709	White Spruce	*Picea glauca*	Native	1	20			2.0	Improbable	Fair	Remove	Assymetrical growth north due to adjacent trees; minor dieback of lower branches.
1710	Little-leaf Linden	*Tilia cordata*	Non-native	1	36			5.5	Improbable	Fair	Remove	Vigorous basal shoots; extensive defoliation due to Japanese Jewel Beetle; wounds from past pruning cuts.
1711	Blue Spruce	*Picea pungens*	Non-native	1	47			3.0	Improbable	Good	Remove	Minor shade pruning, slightly uneven lower crown due to competition for sunlight.
1712	Blue Spruce	*Picea pungens*	Non-native	1	16			2.0	Improbable	Good	Remove	Leans slightly south, competition for sunlight.
1713	Blue Spruce	*Picea pungens*	Non-native	1	27			2.0	Improbable	Excellent	Remove	Full crown, good form, no visible defects.
1714	Blue Spruce	*Picea pungens*	Non-native	1	25			2.0	Improbable	Fair	Remove	Some dieback throughout lower half of crown.
1715	Little-leaf Linden	*Tilia cordata*	Non-native	1	45			4.0	Improbable	Fair	Remove	Mower damage to exposed roots; defoliation by Japanese Jewel Beetle; good form.
1716	Blue Spruce	*Picea pungens*	Non-native	1	30			3.0	Improbable	Good	Remove	Exuding sap from a few small cracks, minor shade pruning, beetles present.
1717	White Spruce	*Picea glauca*	Native	1	40			3.5	Improbable	Fair	Remove	Some dieback throughout lower branches.

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Tree Inventory Data

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH 1 (cm)	DBH 2 (cm)	DBH 3 (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Proposed Action	Comments
1718	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	20			4.5	Possible	Fair	Remove	Historical pruning; wounds on root flare from mower damage; partially sealed stem wounds.
1719	Blue Spruce	*Picea pungens*	Non-native	1	30			3.0	Improbable	Good	Remove	Vine impacting uppermost canopy, minor shade pruning.
1720	Blue Spruce	*Picea pungens*	Non-native	1	25			2.5	Improbable	Fair	Remove	Assymetrical crown west due to adjacent tree; minor dieback of lower branches.
1721	Little-leaf Linden	*Tilia cordata*	Non-native	1	42			4.0	Improbable	Good	Remove	Minor mower damage to exposed roots, minor included bark.
1722	White Spruce	*Picea glauca*	Native	1	24			3.0	Improbable	Good	Remove	Somewhat sparse crown; minor shrub growth in lower canopy.
1723	Blue Spruce	*Picea pungens*	Non-native	1	30			3.0	Improbable	Fair	Remove	Suppressed on east side due to neighboring tree; otherwise healthy crown.
1724	Little-leaf Linden	*Tilia cordata*	Non-native	1	39			4.0	Improbable	Good	Remove	Minor epicormic growth, minor included bark.
1725	Norway Spruce	*Picea abies*	Non-native	2	20	15		1.5	Improbable	Fair	Remove	Codominant stems with included bark; minor dieback of lower branches.
1726	Little-leaf Linden	*Tilia cordata*	Non-native	1	48			6.5	Improbable	Fair	Remove	Basal shoots; leaf spots; defoliation; some crowded branching; otherwise good attachment.
1727	Norway Spruce	*Picea abies*	Non-native	1	32			3.0	Improbable	Good	Remove	Vine entering canopy, minor shade pruning.
1728	Norway Spruce	*Picea abies*	Non-native	1	40			2.5	Improbable	Fair	Remove	Gumosis; light pruning.
1729	White Spruce	*Picea glauca*	Native	1	47			3.5	Improbable	Good	Remove	Low-lying branches; healthy crown; good form.
1730	Blue Spruce	*Picea pungens*	Non-native	1	30			1.5	Improbable	Fair	Remove	Some dieback throughout lower half of crown.
1731	Blue Spruce	*Picea pungens*	Non-native	1	22			3.0	Improbable	Good	Remove	Suppressed crown; decurrent form; healthy foliage.
1732	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	39			5.0	Improbable	Good	Remove	Codominant leaders at 2m, 2 small dead branches, but full crown remains.
1733	Norway Maple	*Acer platanoides*	Non-native	1	41			5.0	Improbable	Good	Remove	Crown suppressed to south; slight lean south; few overextended branches.
1734	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	33			6.0	Improbable	Fair	Remove	Codominant leaders with included bark; light pruning of interior branches.
1735	Norway Spruce	*Picea abies*	Non-native	1	40			4.5	Improbable	Good	Remove	Healthy crown; good form; minor suppression.
1736	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	33			5.0	Improbable	Good	Remove	Codominant leaders with wide union, few small dead branches previously lost.
1737	Norway Spruce	*Picea abies*	Non-native	1	25			2.0	Improbable	Fair	Remove	Minor dieback of lower branches; gumosis.
1738	Manitoba Maple	*Acer negundo*	Native	1	30			2.0	Improbable	Poor	Remove	Minor mower damage to root flare, significant dieback throughout crown, slight lean to north.
1739	Blue Spruce	*Picea pungens*	Non-native	1	13			1.5	Improbable	Fair	Remove	Emerging second leader; very limited crown; historical pruning.
1740	Blue Spruce	*Picea pungens*	Non-native	1	24			1.5	Improbable	Fair	Remove	Tree growing in sand trap; recent pruning of lower branches; codominant leaders with included bark; minor dieback of lower branches.
1741	White Spruce	*Picea glauca*	Native	1	11			1.5	Improbable	Fair	Remove	Weak form; sparse crown; yellowing needles.
1742	Large-toothed Aspen	*Populus grandidentata*	Native	1	82			6.0	Improbable	Good	Remove	Large, mature tree, slight lean in stem self-corrects, small area of staining on stem.
1743	Blue Spruce	*Picea pungens*	Non-native	1	20			1.5	Improbable	Fair	Retain	Crook mid-stem; dieback throughout lower branches.
1744	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	37			4.5	Improbable	Good	Remove	Minor mower damage to root flare; minor dieback from light stress.
1746	White Spruce	*Picea glauca*	Native	1	11			1.0	Improbable	Fair	Remove	Browning needles; tilted crown due to historical failure of leader; phototrophic branches; weak attachment.
1748	Blue Spruce	*Picea pungens*	Non-native	1	22			1.5	Improbable	Fair	Remove	Some defoliation and dieback, history of small branch pruning.
1749	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	13			1.5	Improbable	Fair	Retain	Codominant leaders with included bark; minor dieback of lower branches.
1751	Blue Spruce	*Picea pungens*	Non-native	1	14			1.5	Possible	Fair	Retain	Heavy lean west; crown suppressed to west; raised crown.
1752	Blue Spruce	*Picea pungens*	Non-native	1	14			1.0	Improbable	Good	Retain	Minor shade pruning in lower branches, slight bend in stem self-corrects.

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Tree Inventory Data

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1753	Norway Maple	*Acer platanoides*	Non-native	1	20			2.5	Improbable	Fair	Retain	Multiple leaders with included bark; minor dieback of lower branches.
1754	White Spruce	*Picea glauca*	Native	1	12			1.0	Improbable	Poor	Retain	Limited live crown; raised crown; 40% dieback, likely from light stress.
1755	Norway Spruce	*Picea abies*	Non-native	1	13			1.5	Improbable	Poor	Retain	Significant dieback, secondary vertical branch
1756	Blue Spruce	*Picea pungens*	Non-native	1	12			0.5	Possible	Very Poor	Remove	95% crown dieback.
1757	Norway Spruce	*Picea abies*	Non-native	1	28			3.5	Improbable	Good	Retain	Low-lying branches; healthy crown; good form.
1758	Norway Spruce	*Picea abies*	Non-native	1	15			2.5	Improbable	Fair	Retain	Sparse crown; leaf galls.
1759	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	15			2.5	Improbable	Fair	Retain	Codominant leaders with included bark; minor dieback of lower branches.
1760	Norway Maple	*Acer platanoides*	Non-native	1	26			4.0	Improbable	Fair	Retain	Some defoliation with leaves retained at the end of branches, rusty spots on leaves.
1761	White Spruce	*Picea glauca*	Native	1	15			2.0	Improbable	Fair	Retain	Canopy suppression due to adjacent tree; slight phototrophic lean.
1763	Manitoba Maple	*Acer negundo*	Native	3	33	29	22	6.0	Possible	Fair	Remove	Multiple sprawling leaders; lateral growth; epicormic shoots.
1764	Norway Spruce	*Picea abies*	Non-native	1	61			4.5	Improbable	Good	Remove	No visible defects; good form.
1765	Norway Spruce	*Picea abies*	Non-native	3	23			3.0	Improbable	Good	Retain	Raised crown; healthy crown; good form.
1766	White Spruce	*Picea glauca*	Native	1	22			2.0	Improbable	Excellent	Retain	Growing on terrace, full crown, no visible defects.
1767	Eastern White Pine	*Pinus strobus*	Native	1	23			2.0	Improbable	Fair	Retain	Thin crown; previous pruning of lower branches; minor dieback of lower branches.
1768	White Spruce	*Picea glauca*	Native	1	22			2.0	Improbable	Good	Retain	Exuding sap from one small area, minor competition for sunlight.
1769	Blue Spruce	*Picea pungens*	Non-native	3	24			3.0	Improbable	Good	Retain	Western side of crown suppressed by adjacent tree; self-pruning; few browning needles.
1770	White Spruce	*Picea glauca*	Native	1	20			1.5	Improbable	Fair	Retain	Assymetrical growth south due to adjacent trees; surpressed by neighbouring oak; gumosis.
1771	English Oak	*Quercus robur*	Non-native	1	40			4.0	Improbable	Good	Retain	Sapsucker damage, full crown despite competition for sunlight.
1772	White Spruce	*Picea glauca*	Native	3	28			3.0	Improbable	Fair	Retain	Crown suppression to east and west due to neighboring trees; self-pruning.
1773	White Spruce	*Picea glauca*	Native	3	36			3.5	Improbable	Fair	Retain	Minor root girdling; crown suppression on all sides from neighboring trees.
1774	Little-leaf Linden	*Tilia cordata*	Non-native	3	38			6.0	Improbable	Fair	Retain	Basal shoots; included bark; defoliation by Japanese Jewel Beetle.
1775	White Spruce	*Picea glauca*	Native	1	25			4.0	Improbable	Fair	Retain	Assymetrical growth north due to adjacent trees; light pruning; girdling root.
1776	Blue Spruce	*Picea pungens*	Non-native	1	29			2.5	Improbable	Good	Retain	Minor shade pruning due to competition for sunlight.
1777	Norway Spruce	*Picea abies*	Non-native	1	44			4.0	Improbable	Good	Retain	Slight lean north; few phototrophic branches; minor canopy suppression.
1778	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	25			5.0	Possible	Fair	Retain	Swollen root flare as a result of mechanical damage; assymetrical growth south due to adjacent trees; minor dieback of lower branches.
1779	Blue Spruce	*Picea pungens*	Non-native	1	35			3.0	Improbable	Good	Retain	Slightly uneven lower crown due to competition for sunlight.
1780	Blue Spruce	*Picea pungens*	Non-native	1	25			3.0	Improbable	Good	Retain	Emerging second leader; some needle browning; minor canopy suppression.
1781	White Spruce	*Picea glauca*	Native	1	25			2.5	Improbable	Fair	Retain	Light pruning; minor dieback of lower branches.
1782	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	22			4.5	Improbable	Good	Retain	Few sealed mechanical wounds; minor lower branch dieback.
1783	White Spruce	*Picea glauca*	Native	1	30			3.5	Improbable	Fair	Retain	Light pruning; minor dieback of lower branches.
1784	Blue Spruce	*Picea pungens*	Non-native	1	26			2.0	Improbable	Good	Retain	Shade pruning of lower and inner branches, very slight lean self-corrects.
1785	Eastern White Pine	*Pinus strobus*	Native	1	32			4.5	Possible	Good	Retain	Three codominant leaders; weak attachment; included bark; resin seepage; minor mower damage to root flare.
1786	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	24			6.0	Improbable	Fair	Retain	Codominant leaders with included bark; some dieback of lower branches.

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1787	Blue Spruce	*Picea pungens*	Non-native	1	12			1.0	Possible	Poor	Remove	Major defoliation throughout crown, several lower branches dead.
1788	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	18			3.0	Possible	Fair	Retain	Codominant leaders with included bark; mechanical damage at base with some decay; minor dieback of lower branches.
1789	Eastern White Pine	*Pinus strobus*	Native	1	22			3.0	Improbable	Good	Retain	Raised crown; resin seepage; minor chlorosis.
1790	Norway Spruce	*Picea abies*	Non-native	1	25			2.0	Improbable	Fair	Remove	Lower crown recently pruned, defoliation in mid-crown.
1791	Blue Spruce	*Picea pungens*	Non-native	1	21			2.0	Improbable	Poor	Remove	Crown raised, dieback in remaining crown.
1792	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	17			3.5	Improbable	Fair	Remove	Minor epicormic shoots; minor twig dieback; awkward branching from historical pruning cuts.
1793	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	21			2.5	Possible	Poor	Remove	50% crown dieback; mechanical damage at base with some decay; codominant leaders with included bark.
1794	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	22			5.0	Improbable	Good	Remove	Wound at root flare from mower damage; crown somewhat suppressed; minor chlorosis.
1795	Little-leaf Linden	*Tilia cordata*	Non-native	1	34			3.0	Improbable	Fair	Retain	Vigorous basal shoots; flush cuts; leaf spots; defoliation; Red Nail Gall.
1796	Little-leaf Linden	*Tilia cordata*	Non-native	1	36			4.5	Improbable	Good	Retain	Flush cuts; mounded base; minor defoliation.
1797	White Spruce	*Picea glauca*	Native	1	20			3.0	Improbable	Poor	Remove	Suppressed to east by adjacent tree; 80% canopy dieback; heavy seed crop.
1798	Green Ash	*Fraxinus pennsylvanica*	Native	1	15			3.0	Improbable	Good	Remove	Suppressed to east; suppressed in lower crown; healthy crown.
1799	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	20			4.0	Improbable	Good	Remove	Curved stem; lower branch dieback.
1800	Norway Maple	*Acer platanoides*	Non-native	1	30			3.5	Improbable	Fair	Remove	Mounded base; root wounds from mower damage; healthy crown.
1801	White Spruce	*Picea glauca*	Native	1	18			3.0	Improbable	Good	Remove	Heavy seed crop; healthy crown.
1802	White Spruce	*Picea glauca*	Native	1	18			2.5	Improbable	Poor	Remove	Mechanical wound to lower stem; 80% dieback.
1803	White Spruce	*Picea glauca*	Native	1	25			2.5	Improbable	Fair	Remove	Lower branch dieback; sparse crown; good form.
1804	White Spruce	*Picea glauca*	Native	1	26			2.5	Improbable	Good	Remove	Sealed basal wound; phototrophic lower branches.
1805	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	19			3.5	Improbable	Good	Remove	Sealed basal wound; mower damage to root flare; lower branch dieback; slight lean east.
1806	Little-leaf Linden	*Tilia cordata*	Non-native	1	17			2.5	Improbable	Fair	Remove	Damage to root flare; epicormic shoots; basal wounds.
1807	Blue Spruce	*Picea pungens*	Non-native	1	22			2.5	Improbable	Fair	Remove	Codominant upper leaders; crown suppressed to west; somewhat sparse.
1808	White Spruce	*Picea glauca*	Native	1	22			3.0	Improbable	Good	Remove	Suppressed to west; lower branch dieback.
1809	White Spruce	*Picea glauca*	Native	1	15			2.0	Improbable	Fair	Remove	Suppressed crown; live growth limited.
1810	White Spruce	*Picea glauca*	Native	1	27			3.0	Improbable	Good	Remove	Asymmetrical crown oriented east; slight lean east.
1811	White Spruce	*Picea glauca*	Native	1	21			3.0	Improbable	Good	Remove	Somewhat sparse crown; resin seepage.
1812	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	16			4.0	Improbable	Good	Remove	Asymmetrical crown oriented north; suppressed; minor twig dieback.
1813	White Spruce	*Picea glauca*	Native	1	14			2.5	Improbable	Fair	Remove	Sparse crown; heavy seed crop.
1814	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	21			4.0	Improbable	Good	Remove	Lower branch dieback; suppressed crown.
1815	White Spruce	*Picea glauca*	Native	1	18			2.5	Improbable	Fair	Remove	Mechanical damage; torn branches; minor canopy dieback.
1816	Willow sp.	*Salix sp.*	Native	1	62			6.0	Probable	Fair	Remove	Wounds at root flare from mower damage; basal shoots; dead lower branch likely to fail; overextended branches.
1817	White Spruce	*Picea glauca*	Native	1	29			4.5	Improbable	Good	Remove	Healthy crown; somewhat suppressed to north.
1818	White Spruce	*Picea glauca*	Native	1	36			4.0	Improbable	Good	Remove	Suppressed to north and south; healthy crown.
1819	Blue Spruce	*Picea pungens*	Non-native	1	28			4.0	Improbable	Good	Remove	Codominant upper leaders; included bark; somewhat suppressed to north and south.
1820	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	20			3.5	Improbable	Good	Remove	Mower damage to root flare; lower branch dieback.
1821	White Spruce	*Picea glauca*	Native	1	14			2.0	Possible	Fair	Remove	Sparse crown; basal wound; disturbed soil base.
1822	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	23			5.0	Improbable	Good	Remove	Curved structural branches; weak attachment; slight lean west.
1823	White Spruce	*Picea glauca*	Native	1	20			2.5	Improbable	Good	Remove	Full, healthy crown; good form.

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Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH 1 (cm)	DBH 2 (cm)	DBH 3 (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Proposed Action	Comments
1824	Norway Maple	*Acer platanoides*	Non-native	1	10			1.5	Possible	Fair	Remove	Large wound at root flare; sealed stem fissure; ants; possible internal decay.
1825	White Spruce	*Picea glauca*	Native	1	35			4.0	Improbable	Good	Remove	Healthy crown; good form.
1826	Sweet Crabapple	*Malus coronaria*	Native	1	15			3.5	Improbable	Fair	Remove	Pruned basal shoots; leaf rust.
1827	White Spruce	*Picea glauca*	Native	1	11			1.5	Improbable	Fair	Remove	Slight lean south; sparse crown; suppressed to north.
1828	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	11			4.5	Improbable	Good	Remove	Emerging basal leader; past pruning cuts.
1829	Blue Spruce	*Picea pungens*	Non-native	1	29			4.0	Improbable	Good	Remove	Full, healthy crown; good form.
1830	White Spruce	*Picea glauca*	Native	1	24			3.5	Improbable	Good	Remove	Full, healthy crown; good form.
1831	White Spruce	*Picea glauca*	Native	1	28			3.5	Improbable	Fair	Remove	Slight lean east; somewhat suppressed.
1832	White Spruce	*Picea glauca*	Native	1	31			4.5	Improbable	Good	Remove	Full, healthy crown; somewhat suppressed.
1833	White Spruce	*Picea glauca*	Native	1	21			2.5	Improbable	Fair	Remove	Crown suppressed on all sides; live growth limited to top.
1834	White Spruce	*Picea glauca*	Native	1	13			3.0	Improbable	Fair	Remove	Light stress due to suppression; browning needles.
1835	Norway Maple	*Acer platanoides*	Non-native	1	33			4.0	Improbable	Good	Remove	Historical stem girdling; full, healthy crown; great form.
1836	Norway Maple	*Acer platanoides*	Non-native	1	25			4.0	Possible	Fair	Remove	Root girdling; 15% dieback; weeping form.
1837	White Spruce	*Picea glauca*	Native	1	22			4.0	Improbable	Fair	Remove	Minor suppression to west; canopy somewhat sparse.
1838	White Spruce	*Picea glauca*	Native	1	19			3.0	Improbable	Fair	Remove	Self-directed stem; canopy suppression to east.
1839	Norway Maple	*Acer platanoides*	Non-native	1	33			5.0	Improbable	Good	Remove	Full, healthy crown; basal wound with frass; good form.
1840	White Spruce	*Picea glauca*	Native	1	17			2.5	Improbable	Fair	Remove	Suppressed to west; corrected stem.
1841	White Spruce	*Picea glauca*	Native	1	32			5.0	Improbable	Good	Remove	Curved, phototrophic leader; healthy crown.
1842	Eastern White Pine	*Pinus strobus*	Native	1	40			4.0	Improbable	Good	Remove	Historical branch failure; asymmetrical crown due south.
1843	Eastern White Pine	*Pinus strobus*	Native	1	17			3.5	Improbable	Good	Remove	Light fixture; vine growth in lower canopy; self-pruning.
1844	Black Walnut	*Juglans nigra*	Native	1	52			7.5	Improbable	Good	Retain	Asymmetrical crown due east; minor branch dieback; minor defoliation.
1845	Black Walnut	*Juglans nigra*	Native	1	67			7.5	Possible	Good	Prune	Phototrophic structural branches oriented east; poor attachment; low-hanging branches likely to fail; pruning recommended.
1846	Black Walnut	*Juglans nigra*	Native	1	65			9.0	Possible	Good	Prune	Stem wound, partially sealed, with exposed cambium and small cavities; some phototrophic branches with poor attachment.
1847	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	27			4.5	Improbable	Good	Remove	Mower damage to root flare; minor epicormics; lower branch dieback; structural pruning recommended.
1848	Blue Spruce	*Picea pungens*	Non-native	1	30			4.0	Improbable	Good	Remove	Form somewhat decurrent; competition in upper canopy.
1849	White Spruce	*Picea glauca*	Native	1	24			4.0	Improbable	Fair	Remove	10% dieback; heavy seed crop; vine growth in lower canopy.
1850	White Spruce	*Picea glauca*	Native	1	16			3.5	Improbable	Fair	Remove	Slight lean north; sparse crown.
1851	Norway Maple	*Acer platanoides*	Non-native	1	11			2.0	Possible	Fair	Remove	Swollen root flare from mower damage; partially sealed mechanical wound at base; healthy crown.
1852	Black Walnut	*Juglans nigra*	Native	1	49			7.0	Improbable	Good	Retain	Minor dieback, likely from light stress; some phototrophic branching; healthy crown.
1853	White Spruce	*Picea glauca*	Native	1	20			3.0	Improbable	Good	Remove	Self-correctes stem; self-pruning; somewhat suppressed.
1854	Black Walnut	*Juglans nigra*	Native	1	50			7.0	Possible	Good	Remove	Fused codominant upper leaders; weak attachment; lower branch dieback.
1855	White Spruce	*Picea glauca*	Native	1	19			4.0	Improbable	Good	Remove	Crown somewhat suppressed; heavy seed crop.
1856	White Spruce	*Picea glauca*	Native	1	40			4.5	Improbable	Good	Remove	Full, healthy crown; low-lying branches.
1857	Black Walnut	*Juglans nigra*	Native	1	52			7.0	Improbable	Good	Remove	Minor defoliation; mower damage to root flare; lower branch dieback.
1858	White Spruce	*Picea glauca*	Native	1	13			2.0	Possible	Poor	Remove	Significant dieback.
1859	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	29			5.0	Improbable	Good	Remove	Full large crown; good form.
1860	Blue Spruce	*Picea pungens*	Non-native	1	30			3.0	Improbable	Good	Remove	Shrub competition in lower canopy; healthy crown.
1861	White Spruce	*Picea glauca*	Native	2	25	20		5.0	Improbable	Fair	Remove	Multiple stems; union quite low; sap oozing; healthy crown.
1862	White Spruce	*Picea glauca*	Native	1	33			3.0	Improbable	Good	Remove	Full large crown; good form.

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Tree Inventory Data

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH 1 (cm)	DBH 2 (cm)	DBH 3 (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Proposed Action	Comments
1863	European Mountain-ash	*Sorbus aucuparia*	Non-native	1	19			2.5	Possible	Poor	Remove	Mower damage to root flare; basal shoots; 40% dieback; near-complete defoliation by Japanese Jewel Beetle.
1864	White Spruce	*Picea glauca*	Native	1	35			3.0	Improbable	Good	Remove	Full large crown; good form; weak leader at top.
1865	White Spruce	*Picea glauca*	Native	1	20			4.0	Improbable	Good	Remove	Minor thinning; generally healthy.
1866	Norway Maple	*Acer platanoides*	Non-native	1	38			4.5	Improbable	Good	Remove	Minor damage to root flare; sealed trunk fissure; some weak attachment.
1867	Blue Spruce	*Picea pungens*	Non-native	1	30			3.5	Improbable	Good	Remove	Healthy crown; good form.
1868	White Spruce	*Picea glauca*	Native	1	25			2.0	Improbable	Poor	Remove	Dieback throughout, 70% of crown.
1869	White Spruce	*Picea glauca*	Native	1	17			3.0	Probable	Very Poor	Remove	Dead lower 70% of crown.
1870	White Spruce	*Picea glauca*	Native	1	25			4.5	Improbable	Good	Remove	Healthy crown; good form; minor thinning.
1871	Blue Spruce	*Picea pungens*	Non-native	1	28			2.0	Improbable	Fair	Remove	Twig dieback of interior branches.
1873	Norway Maple	*Acer platanoides*	Non-native	1	27			3.5	Improbable	Fair	Remove	Girdling root; 10% dieback; clustered leaves.
1874	Blue Spruce	*Picea pungens*	Non-native	1	21			3.0	Possible	Poor	Remove	Major dieback; dead branches.
1875	Blue Spruce	*Picea pungens*	Non-native	1	21			1.5	Improbable	Poor	Remove	One side of tree dead.
1876	Blue Spruce	*Picea pungens*	Non-native	1	27			3.5	Improbable	Fair	Remove	Partially suppressed by maple; generally good form.
1877	Sugar Maple	*Acer saccharum*	Native	1	19			3.0	Improbable	Good	Remove	Full healthy crown; codominant leaders.
1878	White Spruce	*Picea glauca*	Native	2	34	28		4.5	Possible	Good	Remove	Codominant stems; included bark; pruning cuts; resin seepage.
1879	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	19			4.0	Improbable	Good	Remove	Root wound; asymmetrical crown; suppressed.
1880	Norway Maple	*Acer platanoides*	Non-native	1	30			4.0	Improbable	Good	Remove	Root girdling; root damage from mower; 10% dieback.
1881	Blue Spruce	*Picea pungens*	Non-native	1	29			4.5	Possible	Poor	Remove	50% dead twigs and branches.
1882	Blue Spruce	*Picea pungens*	Non-native	1	28			3.0	Possible	Fair	Remove	Codominant stems; significant dieback.
1883	Blue Spruce	*Picea pungens*	Non-native	1	13			3.0	Possible	Very Poor	Remove	Only the top is still alive; dead branches below.
1884	Norway Maple	*Acer platanoides*	Non-native	1	26			3.5	Improbable	Good	Remove	Full large crown; erect form.
1885	Blue Spruce	*Picea pungens*	Non-native	1	12			2.0	Possible	Poor	Remove	60% of lower crown dead. Healthy top.
1886	Blue Spruce	*Picea pungens*	Non-native	1	10			1.0	Improbable	Very Poor	Remove	Only top 15% of crown alive.
1887	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	19			4.0	Improbable	Good	Remove	One moderately callused branch wound; good form.
1888	Blue Spruce	*Picea pungens*	Non-native	1	28			4.0	Possible	Fair	Remove	Major dieback; dead branches.
1889	White Spruce	*Picea glauca*	Native	1	28			3.0	Improbable	Good	Remove	Self-pruning; mechanical damage to branches.
1890	Blue Spruce	*Picea pungens*	Non-native	1	24			2.5	Improbable	Good	Remove	Raised crown; somewhat suppressed; sparse crown.
1891	White Spruce	*Picea glauca*	Native	1	12			2.5	Improbable	Poor	Remove	70% crown dieback; volunteer maples surrounding tree.
1892	Blue Spruce	*Picea pungens*	Non-native	1	24			2.0	Improbable	Poor	Remove	40% crown dieback of mid and lower crown; epicormic shoots.
1893	Blue Spruce	*Picea pungens*	Non-native	1	33			4.5	Improbable	Fair	Remove	Thinning of lower branches.
1894	White Spruce	*Picea glauca*	Native	1	30			5.0	Improbable	Fair	Remove	Thinning in lower, shaded crown.
1895	Norway Maple	*Acer platanoides*	Non-native	1	31			5.5	Improbable	Good	Remove	Large full crown; some staining on bark; slightly suppressed crown.
1896	White Spruce	*Picea glauca*	Native	1	20			3.0	Improbable	Good	Remove	Canopy suppressed to north; live growth limited to south side.
1897	Norway Maple	*Acer platanoides*	Non-native	1	27			5.0	Improbable	Good	Remove	Root girdling; canopy full but suppressed; historical flush cuts.
1898	Blue Spruce	*Picea pungens*	Non-native	1	15			2.0	Improbable	Poor	Remove	50% crown dieback of mid and lower crown; partially suppressed.
1899	White Spruce	*Picea glauca*	Native	1	19			3.0	Improbable	Fair	Remove	Raised crown; mower damage to root flare; phototrophic branches with weak attachment.
1900	European Mountain-ash	*Sorbus aucuparia*	Non-native	1	13			2.0	Possible	Dead	Remove	Large basal cavity; fruiting bodies on stem.
1901	White Spruce	*Picea glauca*	Native	1	21			2.5	Possible	Dead	Remove	Likely declined from light stress.
1903	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	13			3.0	Improbable	Fair	Remove	Somewhat sparse crown; one large basal shoot; tree guard.
1904	White Spruce	*Picea glauca*	Native	1	19			4.0	Improbable	Fair	Remove	Healthy crown with minor thinning.
1905	Norway Maple	*Acer platanoides*	Non-native	1	29			5.0	Improbable	Good	Remove	Root wound; root girdling; healthy crown.
1906	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	18			4.0	Improbable	Fair	Remove	Crown asymmetrical, leaning towards pond, minor epicormic shoots.
1907	White Spruce	*Picea glauca*	Native	1	11			1.5	Probable	Poor	Remove	40 degree lean towards pond; 80% crown dieback; cracking at base.
1908	White Spruce	*Picea glauca*	Native	1	19			2.0	Improbable	Poor	Remove	Advanced dieback of mid and lower crown (70%).
1909	White Spruce	*Picea glauca*	Native	1	25			2.5	Improbable	Fair	Remove	Sparse crown due to light suppression; self-corrects leader.

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Tree Inventory Data

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH 1 (cm)	DBH 2 (cm)	DBH 3 (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Proposed Action	Comments
1910	Common Hackberry	*Celtis occidentalis*	Native	1	15			3.5	Improbable	Good	Remove	Minor epicormic growth; full crown despite tight planting.
1911	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	24			4.5	Improbable	Good	Remove	Healthy crown; slightly suppressed.
1912	White Spruce	*Picea glauca*	Native	1	26			3.0	Improbable	Good	Remove	Few torn branches; healthy crown.
1913	Japenese Zelkova	*Zelkova serrata*	Non-native	1	20			3.0	Improbable	Good	Remove	Minor dieback in canopy; great form.
1914	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	16			3.0	Improbable	Fair	Remove	Dead lower branches; suppressed by adjacent trees; dead epicormic shoots.
1915	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	17			3.0	Improbable	Fair	Remove	Somewhat sparse crown; several epicormic shoots.
1916	European Mountain-ash	*Sorbus aucuparia*	Non-native	1	12			3.0	Improbable	Good	Remove	Epicormic shoots; defoliation in outer crown; epicormic shoots.
1917	Common Hackberry	*Celtis occidentalis*	Native	1	12			2.0	Improbable	Good	Remove	Minor basal wounds; vigorous crown.
1918	White Spruce	*Picea glauca*	Native	1	22			2.0	Possible	Very Poor	Remove	75% dieback; severed vines.
1919	White Spruce	*Picea glauca*	Native	1	22			3.0	Improbable	Fair	Remove	Thinning crown; heavy seed crop; shrub competition.
1920	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	28			5.5	Improbable	Good	Remove	Full healthy crown with minor thinning.
1921	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	21			2.5	Improbable	Fair	Remove	Old trunk wounds with sap production; twig dieback through mid crown.
1922	Norway Maple	*Acer platanoides*	Non-native	1	17			2.5	Possible	Fair	Remove	Multiple large, sealed stem wounds; dead structural branch; 15% dieback.
1923	Norway Maple	*Acer platanoides*	Non-native	1	36			4.0	Improbable	Fair	Remove	Some crowding of branch unions; dense crown; minor thinning.
1924	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	38			6.5	Improbable	Good	Remove	Large full crown; good form.
1925	Little-leaf Linden	*Tilia cordata*	Non-native	1	35			3.5	Improbable	Fair	Remove	Vigorous basal shoots; extensive defoliation by Japanese Jewel Beetle.
1926	White Spruce	*Picea glauca*	Native	1	20			4.0	Improbable	Good	Remove	Minor thinning.
1927	White Spruce	*Picea glauca*	Native	1	40			4.0	Improbable	Good	Remove	Full large crown; minor interior twig dieback.
1928	White Spruce	*Picea glauca*	Native	1	23			2.0	Improbable	Fair	Remove	10% dieback; young ash growing through canopy; slight lean west.
1929	White Spruce	*Picea glauca*	Native	1	16			3.0	Improbable	Fair	Remove	30% crown dieback, throughout crown; minor wound at base.
1930	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	29			5.0	Improbable	Good	Remove	Light crown with some dieback; minor epicormic growth.
1931	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	31			4.5	Improbable	Good	Remove	Full large crown.
1932	White Spruce	*Picea glauca*	Native	1	30			5.0	Improbable	Good	Remove	Minor thinning.
1933	White Spruce	*Picea glauca*	Native	1	25			5.0	Improbable	Excellent	Remove	Dense healthy crown to base.
1934	White Spruce	*Picea glauca*	Native	1	37			4.0	Improbable	Good	Remove	Full, dense crown; resin seepage.
1935	Blue Spruce	*Picea pungens*	Non-native	1	35			5.5	Improbable	Good	Remove	Minor thinning.
1936	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	39			8.0	Improbable	Good	Remove	Full large crown; dead epicormic shoots
1937	White Spruce	*Picea glauca*	Native	1	28			3.0	Improbable	Good	Remove	Witch's broom; raised crown; torn branches.
1938	Blue Spruce	*Picea pungens*	Non-native	1	35			4.5	Improbable	Fair	Remove	Minor dieback in upper crown.
1939	White Spruce	*Picea glauca*	Native	1	26			3.5	Improbable	Fair	Remove	Suppressed with dieback on one half by maple
1940	Norway Maple	*Acer platanoides*	Non-native	1	39			4.0	Improbable	Fair	Remove	Root girdling; few phototrophic branches with weak attachment.
1941	White Spruce	*Picea glauca*	Native	1	23			2.5	Improbable	Fair	Remove	Suppressed and sparse mid and lower crown; branches primed for path clearance.
1942	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	18			3.0	Improbable	Fair	Remove	Minor dieback where crown is supporessed; minor upward facing wound on branch union.
1943	Blue Spruce	*Picea pungens*	Non-native	1	11			1.5	Improbable	Poor	Remove	Multiple small stems; mounded base; limited live crown.
1944	White Spruce	*Picea glauca*	Native	1	16			3.0	Improbable	Fair	Remove	Suppressed on one half of tree; twig dieback in mid and lower crown.
1945	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	14			3.5	Improbable	Poor	Remove	80% dieback; poor pruning; light stress; limited live growth due to suppression.
1946	Blue Spruce	*Picea pungens*	Non-native	1	13			3.0	Possible	Fair	Remove	Minor crown thinning.
1947	Norway Maple	*Acer platanoides*	Non-native	1	23			5.5	Improbable	Fair	Remove	Dense crown with associated thinning.
1948	Norway Maple	*Acer platanoides*	Non-native	1	37			5.0	Improbable	Fair	Remove	Girdling root; crown suppressed to north; codominant leaders; included bark.

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Tree Inventory Data

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH 1 (cm)	DBH 2 (cm)	DBH 3 (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Proposed Action	Comments
1949	Norway Maple	*Acer platanoides*	Non-native	1	33			5.0	Improbable	Fair	Remove	Dense crown with dead lower branches; slightly suppressed.
1951	White Spruce	*Picea glauca*	Native	1	22			2.5	Improbable	Poor	Remove	Highly suppressed crown causing dieback;
1952	White Spruce	*Picea glauca*	Native	1	31			3.5	Improbable	Good	Remove	Asymmetrical crown to east.
1953	White Spruce	*Picea glauca*	Native	1	23			3.5	Improbable	Fair	Remove	Half of crown suppressed and with dieback; interior twig dieback.
1954	White Spruce	*Picea glauca*	Native	1	28			4.0	Improbable	Fair	Remove	Inner live crown limited; suppressed to north.
1955	White Spruce	*Picea glauca*	Native	1	24			3.0	Improbable	Fair	Remove	Half of crown suppressed, showing dieback.
1956	Little-leaf Linden	*Tilia cordata*	Non-native	1	30			3.5	Improbable	Fair	Remove	Crowded branching; defoliation by Japanese Jewel Beetle.
1957	White Spruce	*Picea glauca*	Native	1	26			3.5	Improbable	Good	Remove	Resin seepage; minor canopy suppression to east and west.
1958	Norway Maple	*Acer platanoides*	Non-native	1	34			5.0	Improbable	Fair	Remove	Large full crown; crowded branches.
1959	White Spruce	*Picea glauca*	Native	1	33			2.5	Improbable	Good	Remove	Canopy suppressed to west; self-pruning.
1960	White Spruce	*Picea glauca*	Native	1	20			2.5	Improbable	Fair	Remove	Somewhat thinning crown.
1961	Blue Spruce	*Picea pungens*	Non-native	1	31			3.0	Improbable	Good	Remove	Somewhat sparse crown; good form.
1962	Blue Spruce	*Picea pungens*	Non-native	1	25			3.0	Improbable	Fair	Remove	Twig dieback of interior crown.
1963	Norway Maple	*Acer platanoides*	Non-native	1	25			4.0	Improbable	Good	Remove	Mower damage to root flare; included bark.
1964	Norway Maple	*Acer platanoides*	Non-native	1	18			3.0	Improbable	Fair	Retain	Large sealed trunk fissure; sealed wound; 15% dieback.
1965	White Spruce	*Picea glauca*	Native	1	19			2.5	Improbable	Poor	Retain	Mid and lower crown dieback; slight phototrophic lean; weak leader
1966	White Spruce	*Picea glauca*	Native	1	26			4.0	Improbable	Good	Retain	Minor interior twig dieback.
1967	White Spruce	*Picea glauca*	Native	1	27			3.0	Improbable	Good	Retain	Minor interior twig dieback.
1968	White Spruce	*Picea glauca*	Native	1	17			2.5	Improbable	Fair	Retain	Slight lean south; minor mower damage to root flare; sparse crown.
1969	Northern Red Oak	*Quercus rubra*	Native	1	20			4.0	Improbable	Fair	Retain	Mower damage to root flare; few epicormic shoots; leaf spots; defoliation.
1970	White Mulberry	*Morus alba*	Non-native	1	11			1.5	Improbable	Fair	Retain	Cultivar 'urbana'; basal wound; bacterial ooze.
1971	Blue Spruce	*Picea pungens*	Non-native	1	25			2.5	Improbable	Fair	Retain	Slight lean east; somewhat suppressed to south.
1972	Norway Maple	*Acer platanoides*	Non-native	1	25			4.0	Improbable	Good	Retain	Slight lean south; sealed wounds at root flare; healthy crown.
1973	Blue Spruce	*Picea pungens*	Non-native	1	25			2.0	Improbable	Fair	Retain	Slight lean east; few torn branches.
1974	Little-leaf Linden	*Tilia cordata*	Non-native	2	30	23		4.0	Improbable	Good	Retain	Basal shoots; full vigorous crown.
1975	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	26			5.0	Improbable	Fair	Retain	Slight lean south; suppressed on west side; mower damage to root flare; minor twig dieback from light stress.
1976	Little-leaf Linden	*Tilia cordata*	Non-native	4	15	16	13	3.5	Improbable	Good	Retain	Full vigorous crown; epicormic shoots.
1977	White Spruce	*Picea glauca*	Native	1	24			2.5	Improbable	Fair	Retain	Curved stem; emerging second leader; suppressed to south.
1978	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	16			2.0	Improbable	Fair	Retain	At edge of pond; roots broken and exposed over water; slightly sparse crown; weak leader.
1979	Blue Spruce	*Picea pungens*	Non-native	1	11			1.5	Improbable	Good	Retain	Codominant upper leaders; basal wound; root girdling; leans south.
1980	Blue Spruce	*Picea pungens*	Non-native	1	10			1.5	Improbable	Fair	Retain	Basal wound; replaced leader; dieback throughout crown.
1981	White Spruce	*Picea glauca*	Native	1	13			2.0	Improbable	Fair	Retain	Codominant stems; included bark; self-corrected stem; crown somewhat sparse.
1982	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	24			4.0	Probable	Fair	Remove	Heavy lean into pond; stem located at pond edge; minor canopy dieback.
1983	Blue Spruce	*Picea pungens*	Non-native	1	26			3.0	Improbable	Good	Retain	Self-pruning; healthy crown.
1984	Norway Maple	*Acer platanoides*	Non-native	1	25			4.0	Improbable	Fair	Retain	Frost crack, sealed; 5 degree lean; slightly sparse crown.
1985	Green Ash	*Fraxinus pennsylvanica*	Native	1	10			3.5	Improbable	Good	Retain	Multiple small stems joined at base; healthy crown.
1439A	Willow sp.	*Salix sp.*	Native	1	175			11.0	Possible	Fair	Retain	Historical branch failure; winding branches; codominant sprawling leaders; brush piled at base.
A	White Spruce	*Picea glauca*	Native	1	25			4.5	Improbable	Good	Remove	In spruce hedgerow; healthy crown, slightly suppressed.
AA	White Spruce	*Picea glauca*	Native	1	34			4.5	Improbable	Good	Remove	Dense, full crown; recent failure of neighbouring branch resulting in pressure and crown suppression.

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Tree Inventory Data

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AB	Blue Spruce	*Picea pungens*	Non-native	1	34			4.0	Improbable	Fair	Remove	Minor needle browning; sparse crown.
AC	Norway Spruce	*Picea abies*	Non-native	1	42			4.0	Improbable	Good	Remove	Low-lying branches; healthy crown; good form.
AD	White Spruce	*Picea glauca*	Native	1	21			4.0	Improbable	Good	Remove	Healthy crown; heavy seed crop.
AE	White Spruce	*Picea glauca*	Native	1	20			4.5	Improbable	Good	Remove	Minor crown suppression; phototrophic branching.
AF	Blue Spruce	*Picea pungens*	Non-native	1	43			4.5	Improbable	Good	Remove	Codominant upper leaders; dense crown; minor shrub competition in lower crown.
AG	White Spruce	*Picea glauca*	Native	1	29			3.5	Improbable	Good	Remove	Full, healthy crown; dense crown.
AH	White Spruce	*Picea glauca*	Native	1	25			3.5	Improbable	Good	Remove	Short, wide crown; healthy crown.
AI	Norway Spruce	*Picea abies*	Non-native	1	18			3.0	Improbable	Fair	Remove	Minor twig dieback.
AJ	White Ash	*Fraxinus americana*	Native	1	17			3.0	Probable	Very Poor	Remove	Mostly dead; live water sprouts; exfoliating bark.
AK	Eastern White Pine	*Pinus strobus*	Native	1	36			5.5	Improbable	Good	Remove	Minor thinning.
AL	White Mulberry	*Morus alba*	Non-native	6	25	23	20	4.0	Probable	Dead	Remove	Dead tree just up bank of creek.
AM	White Spruce	*Picea glauca*	Native	1	28			3.5	Improbable	Poor	Remove	70% of foliage chlorotic; twig dieback throughout; in spruce hedge.
AN	White Spruce	*Picea glauca*	Native	1	15			2.5	Possible	Dead	Remove	In spruce hedgerow; recently dead; twigs intact.
AO	Norway Spruce	*Picea abies*	Non-native	3	26	20	12	3.0	Improbable	Fair	Retain	In spruce hedgerow; codominant leaders with weak attachment.
AP	American Basswood	*Tilia americana*	Native	1					Improbable	Fair	Retain	75% chlorotic foliage; minor twig dieback.
AQ	White Spruce	*Picea glauca*	Native	1	30			3.5	Improbable	Good	Retain	In spruce hedgerow; good form; healthy crown.
AR	White Spruce	*Picea glauca*	Native	1	26			3.5	Improbable	Good	Retain	In spruce hedgerow; good form; healthy crown.
AS	White Spruce	*Picea glauca*	Native	1	26			4.0	Improbable	Good	Retain	In spruce hedgerow; good form; healthy crown.
AT	White Spruce	*Picea glauca*	Native	1	30			4.0	Improbable	Good	Retain	In spruce hedgerow; good form; healthy crown.
AU	White Spruce	*Picea glauca*	Native	1	30			3.5	Improbable	Fair	Retain	In spruce hedgerow; good form; asymmetrical crown due to suppression.
AV	White Spruce	*Picea glauca*	Native	1	50			3.5	Improbable	Good	Retain	In spruce hedgerow; good form; large vigorous crown.
AW	White Spruce	*Picea glauca*	Native	1	35			3.0	Improbable	Good	Retain	In spruce hedgerow; good form; full crown; codominant leaders.
AX	White Spruce	*Picea glauca*	Native	1	35			3.5	Improbable	Good	Retain	In spruce hedgerow; good form; full crown.
AY	Blue Spruce	*Picea pungens*	Non-native	1	30			3.5	Improbable	Good	Retain	In spruce hedgerow; good form; full crown.
AZ	White Spruce	*Picea glauca*	Native	1	35			3.5	Improbable	Good	Retain	In spruce hedgerow; good form; full crown.
B	Blue Spruce	*Picea pungens*	Non-native	1	28			3.0	Improbable	Fair	Remove	Thinning crown; canopy suppression from adjacent tree.
BA	White Spruce	*Picea glauca*	Native	1	12			2.5	Improbable	Good	Retain	In spruce hedgerow; good form; maple branches growing through crown.
BB	Sugar Maple	*Acer saccharum*	Native	1	55			5.0	Improbable	Good	Retain	Along edge of spruce hedgerow; good form; vigorous crown.
BC	Freeman's Maple	*Acer x freemanii*	Native	5	34	32	31	7.0	Improbable	Good	Retain	Along edge of spruce hedgerow; good form; vigorous crown.
BD	Blue Spruce	*Picea pungens*	Non-native	1	35			3.5	Improbable	Good	Retain	Within spruce hedgerow; good form; vigorous crown; codominant leaders.
BE	Eastern White Cedar	*Thuja occidentalis*	Native	1	19			2.0	Improbable	Good	Retain	Within spruce hedgerow; good form; vigorous crown with pyramidal form.
BF	White Spruce	*Picea glauca*	Native	1	42			3.5	Improbable	Good	Remove	Within spruce hedgerow; good form; vigorous crown with pyramidal form.
BG	White Spruce	*Picea glauca*	Native	1	22			2.5	Improbable	Poor	Remove	Lower half of crown clearance pruned; crown high and small.
BH	White Spruce	*Picea glauca*	Native	1	14			2.0	Improbable	Poor	Retain	Lower two thirds of crown dead and suppressed.
BI	White Spruce	*Picea glauca*	Native	3	20	20	10	2.0	Improbable	Fair	Retain	Lower crown suppressed with dieback.
BJ	White Spruce	*Picea glauca*	Native	1	26			1.5	Improbable	Fair	Retain	Lower third of crown dead and suppressed.
BK	Eastern White Cedar	*Thuja occidentalis*	Native	1	17			2.0	Improbable	Good	Retain	28 trees in single line. Healthy crowns, DBH range 10-17cm.
BL	Black Walnut	*Juglans nigra*	Native	1	24			4.0	Improbable	Good	Retain	Growing through chain link fence; large full open crown.
BM	Sycamore Maple	*Acer pseudoplatanus*	Native	1					Improbable	Good	Retain	
BN	White Spruce	*Picea glauca*	Native	1	32			4.0	Improbable	Fair	Remove	Moderate thinning from adjacent basswood canopy competition
BO	White Spruce	*Picea glauca*	Native	1	26			4.0	Improbable	Fair	Remove	Poor lower canopu vigor.
BP	Blue Spruce	*Picea pungens*	Non-native	1	40			4.5	Improbable	Good	Retain	Sparse canopy on east facing side.
BQ	Northern Red Oak	*Quercus rubra*	Native	1	34			4.0	Improbable	Good	Retain	Good form; light interior twig dieback.
BR	Sugar Maple	*Acer saccharum*	Native	1	41			5.0	Improbable	Good	Retain	Lower branch dieback; previous pruning wounds.
BS	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	38			6.0	Improbable	Good	Retain	Good form; uniform canopy structure.

Kettle Creek Golf Course
Tree Inventory Data

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH 1 (cm)	DBH 2 (cm)	DBH 3 (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Proposed Action	Comments
BT	Blue Spruce	*Picea pungens*	Non-native	1	40			3.5	Improbable	Good	Retain	Good form and vigor.
BU	Blue Spruce	*Picea pungens*	Non-native	1	35			4.0	Improbable	Good	Retain	Sparse crown on east facing side.
BV	White Spruce	*Picea glauca*	Native	1	45			4.5	Improbable	Good	Retain	Good form and vigor.
BW	White Spruce	*Picea glauca*	Native	1	28			3.0	Improbable	Good	Retain	Sparse crown towards middle.
BX	White Spruce	*Picea glauca*	Native	1	50			4.5	Improbable	Good	Retain	Sparse crown on east facing side.
BY	White Spruce	*Picea glauca*	Native	1	48			4.5	Improbable	Excellent	Retain	Excellent form and vigir
BZ	Blue Spruce	*Picea pungens*	Non-native	1	50			4.5	Improbable	Good	Retain	Good vigor.
C	Blue Spruce	*Picea pungens*	Non-native	1	25			3.0	Improbable	Good	Remove	Good form; minor canopy suppression.
CA	Blue Spruce	*Picea pungens*	Non-native	1	26			3.0	Improbable	Fair	Retain	Improper lower branch pruning.
CB	White Spruce	*Picea glauca*	Native	1	43			4.5	Improbable	Fair	Remove	Sparse canopy on east facing side; improper lower pruning.
CC	Manitoba Maple	*Acer negundo*	Native	1	37	33		6.0	Improbable	Fair	Retain	Light trunk lean east; heavy epicormic branching.
CD	American Basswood	*Tilia americana*	Native	1	55			6.0	Improbable	Fair	Retain	Improper lower pruning; lower branches with epicormic shoots.
CE	White Spruce	*Picea glauca*	Native	1	23			3.0	Improbable	Poor	Retain	Multiple improper pruning wounds; poor vigor.
CF	White Spruce	*Picea glauca*	Native	1	19			2.0	Improbable	Fair	Retain	Improper lower branch pruning.
CG	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-native	1	29			6.0	Improbable	Fair	Retain	Canopy trunks growing in opposite directions to avoid adjacentspruce.
CH	White Spruce	*Picea glauca*	Native	1	41			5.0	Improbable	Good	Retain	Improper pruning on one side.
CI	White Spruce	*Picea glauca*	Native	1	51			4.5	Improbable	Good	Retain	Some lower branch pruning.
CJ	White Spruce	*Picea glauca*	Native	1	16			2.0	Improbable	Poor	Retain	Poor vigor.
CK	White Spruce	*Picea glauca*	Native	1	17			2.0	Improbable	Poor	Retain	Suppressed canopy; poor vigor.
CL	White Spruce	*Picea glauca*	Native	1	12			2.0	Improbable	Poor	Retain	Suppressed canopy; poor vigor.
CM	White Spruce	*Picea glauca*	Native	1	16			2.0	Improbable	Fair	Retain	Suppressed canopy; fair vigor.
CN	White Spruce	*Picea glauca*	Native	1	12			2.0	Improbable	Fair	Retain	Suppressed canopy; fair vigor.
CO	White Spruce	*Picea glauca*	Native	1	16	14		2.0	Improbable	Fair	Retain	fair vigor.
CP	White Spruce	*Picea glauca*	Native	1	13			2.0	Improbable	Poor	Retain	Poor vigor.
CQ	White Spruce	*Picea glauca*	Native	1	45			4.0	Improbable	Good	Remove	Good form.
D	Blue Spruce	*Picea pungens*	Non-native	1	24			3.0	Improbable	Good	Remove	Crown suppression from all sides; healthy foliage.
E	Blue Spruce	*Picea pungens*	Non-native	1	30			2.0	Improbable	Fair	Remove	Live growth limited due to canopy suppression from all neighbouring trees; canopy concentrated at top and south side.
F	White Spruce	*Picea glauca*	Native	1	30			3.0	Improbable	Good	Retain	Live growth limited to outer edges of tree due to light suppression.
G	Blue Spruce	*Picea pungens*	Non-native	1	17			2.0	Improbable	Fair	Remove	Some dieback; overall good form.
H	Blue Spruce	*Picea pungens*	Non-native	1	36			3.0	Improbable	Fair	Remove	Very thin crown; needle dieback.
I	Blue Spruce	*Picea pungens*	Non-native	1	27			2.0	Improbable	Fair	Remove	Some dieback; good form.
J	Blue Spruce	*Picea pungens*	Non-native	1	25			1.5	Improbable	Fair	Remove	Good form; full crown.
K	White Spruce	*Picea glauca*	Native	1	25			2.0	Improbable	Fair	Remove	Dieback; suppressed crown.
L	Blue Spruce	*Picea pungens*	Non-native	1	30			2.0	Improbable	Fair	Retain	Suppressed crown; dieback of needles.
M	Norway Spruce	*Picea abies*	Non-native	1	40			3.0	Improbable	Good	Remove	Light pruning; good vigour.
N	Norway Spruce	*Picea abies*	Non-native	2	35	20		3.5	Improbable	Fair	Remove	Codominant leaders with included bark; minor dieback in lower branches.
O	Eastern Cottonwood	*Populus deltoides*	Native	1	35			7.0	Improbable	Fair	Retain	Growing on edge of drainage feature; tall crown; assymetrical crown south due to adjacent tree.
P	Blue Spruce	*Picea pungens*	Non-native	1	40			2.0	Improbable	Fair	Remove	Exposed root with mechanical damage; minor dieback on lower branches.
Q	Blue Spruce	*Picea pungens*	Non-native	1	25			3.0	Improbable	Fair	Remove	Assymetrical growth south due to adjacent trees; good vigour.
R	Norway Spruce	*Picea abies*	Non-native	1	32			3.0	Improbable	Good	Retain	Codominant leaders at 6m, some defoliation.
S	Blue Spruce	*Picea pungens*	Non-native	1	27			3.0	Improbable	Good	Remove	Very dense crown with minimal defoliation, slight s-bend in stem self-corrects.
T	Norway Spruce	*Picea abies*	Non-native	1	22			2.0	Improbable	Good	Retain	Slightly uneven lower crown due to competition for sunlight only.
U	Willow sp.	*Salix sp.*	Native	1	24			4.0	Improbable	Good	Retain	Growing on edge of bank, minor epicormic growth, leans north.
V	Blue Spruce	*Picea pungens*	Non-native	1	20			1.0	Improbable	Excellent	Remove	Very dense crown, good form, no obvious defects.
W	Blue Spruce	*Picea pungens*	Non-native	1	18			2.0	Improbable	Very Poor	Remove	Vine entering canopy, significant dieback.
X	Norway Maple	*Acer platanoides*	Non-native	1	12			1.0	Probable	Very Poor	Remove	Uprooting, root plate partially exposed an coming out of saturated soil towards the south, top of crown self-corrects.

Kettle Creek Golf Course
Tree Inventory Data

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH 1 (cm)	DBH 2 (cm)	DBH 3 (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Proposed Action	Comments
Y	Blue Spruce	*Picea pungens*	Non-native	1	30			2.5	Improbable	Good	Remove	Full, healthy crown; good form.
Z	Blue Spruce	*Picea pungens*	Non-native	1	35			4.0	Improbable	Good	Remove	Very full, healthy crown; good form.

Appendix II
Tree Health and Potential for Structural Failure Assessment Criteria

Tree Health Assessment Criteria

Assessment Criteria	Definition[1]
Excellent	Represents a tree in near perfect form, health, and vigour. This tree would exhibit no deadwood, no decline, and no visible defects.
Good	Represents a tree ranging from a generally healthy tree to a near perfect tree in terms of health, vigour and structure. This tree exhibits a complete, balanced crown structure with little to no deadwood and minimal defects as well as a properly formed root flare.
Fair	Represents a tree with minor health, balance or structural issues with minimal to moderate deadwood. Branching structure shows signs of included bark or minor rot within the branch connections or trunk wood. The root flare shows minimal signs of mechanical injury, decay, poor callusing, or girdling roots. Trees in the category require minor remedial actions to improve the vigour and structure of the tree.
Poor	Represents a tree that exhibits a poor vigour, reduced crown size (<30% of crown typical of species caused by overcrowding or decline), extreme crown imbalance, or extensive rot in the branching and trunk wood. Fungus could be seen from these rotting areas, suggesting further decay. These trees have extensive crown die back with a large amount of deadwood, and possibly dead sections. These weakened areas can lead to a potential failure of tree sections. Rooting zones show signs of extensive root decay or damage (fruiting bodies or mechanical damage) or girdling roots. Trees in this category require more extensive actions to prevent failure. A tree identified as poor would be a candidate for removal in the near future.
Very Poor	Represents a tree that exhibits major health and structural defects. Quite often the defects or diseases affecting this tree will be fatal. Large quantities of fungus, large dead sections with possible cavities and bark falling off all are signs that a tree is in a major state of decline and would be identified as very poor. These trees have a probable or imminent potential for structural failure. These trees should be identified for removal.
Dead	Represents a tree that exhibits no sign of new growth, including buds, foliage, or shoot growth. These trees have a probable or imminent potential for structural failure. These trees should be identified for removal.

[1] (Dunster 2009)

Potential for Structural Failure Assessment Criteria

Assessment Criteria*	Definition[1]
Improbable	The tree or branch is not likely to fail during normal weather conditions and may not fail in many severe weather conditions within the specified time frame.
Possible	Failure could occur, but it is unlikely during normal weather conditions within the specified time frame.
Probable	Failure may be expected under normal weather conditions within the specified time frame.
Imminent	Failure has started or is most likely to occur in the near future, even if there is no significant wind or increased load. This is a rare occurrence for an assessor to encounter, and it may require immediate action to protect people from harm.
	*A specified time frame of 1 year will be used when assessing potential for structural failure.

[1] (Dunster et al. 2013)

Appendix III
Conditions of Assessment

Conditions of Tree Assessment

Limitations

This tree inventory and assessment is based on the circumstances and observations as they existed at the time of the site inspection of the Client's Property in London, Ontario (the "Property") and the trees situated thereon by NRSI and upon information provided by the Client to NRSI. The opinions in this assessment are given based on observations made and using generally accepted professional judgment, however, because trees are living organisms and subject to change, damage and disease, the results, observations, recommendations, and analysis as set out in this assessment are valid only at the date any such observations and analysis took place. No guarantee, warranty, representation or opinion is offered or made by NRSI as to the length of the validity of the results, observations, recommendations and analysis contained within this assessment. As a result, the Client shall not rely upon this assessment, save and except for representing the circumstances and observations, analysis and recommendations that were made as at the date of such inspections. It is recommended that the trees discussed in this assessment should be re-assessed periodically, where required (i.e. within 1 year).

Further Services

Neither NRSI, nor any assessor employed or retained by NRSI (the "Assessor") for the purpose of preparing or assisting in the preparation of this assessment shall be required to provide any further consultation or services to the Client, save and except as already carried out in the preparation of this assessment and including, without limitation, to act as an expert witness or witness in any court in any jurisdiction unless the Client has first made specific arrangements with respect to such further services, including, without limitation, providing the payment of the Assessor's regular hourly billing fees.

NRSI accepts no responsibility for the implementation of all or any part of the assessment, unless specifically requested to examine the implementation of such activities recommended herein. In the event that inspection or supervision of all or part of the implementation is requested, that request shall be in writing and the details agreed to in writing by both parties.

Assumptions

The Client is hereby notified and does hereby acknowledge and agree that where any of the facts and information set out and referenced in this assessment are based on assumptions, facts or information provided to NRSI, the Client and/or third parties and unless otherwise set out within this assessment, NRSI will in no way be responsible for the veracity or accuracy of any such information and further, the Client acknowledges and agrees that NRSI has, for the purposes of preparing their assessment, assumed that the Property, which is the subject of this assessment is in full compliance with all applicable federal, provincial, municipal and local statutes, regulations, by-laws, guidelines and other related laws. NRSI explicitly denies any legal liability for any and all issues with respect to non-compliance with any of the above-referenced statutes, regulations, by-laws, guidelines and laws as it may pertain to or affect the Property to which this assessment applies.

Restriction of Assessment

The assessment carried out was restricted to the Property as identified within this report. No assessment of any other trees has been undertaken by NRSI, save those trees within 5m of property boundaries. NRSI is not legally liable for any other trees on the Property except those expressly discussed herein. The conclusions of this assessment do not apply to any areas, trees, or any other property not covered or referenced in this assessment.

Professional Responsibility

In carrying out this assessment, NRSI and any Assessor appointed for and on behalf of NRSI to perform and carry out the assessment has exercised a reasonable standard of care, skill and diligence as would be customarily and normally provided in carrying out this assessment. The assessment has been made using accepted arboricultural techniques. These include a visual examination of each tree for structural defects, scars, external indications of decay such as fungal fruiting bodies, evidence of insect attack, discolored foliage (during the leaf-on period), the condition of any visible root structures, the degree and direction of lean (if any), the general condition of the tree(s) and the surrounding site, and the current or planned proximity of property and people. Except where specifically noted in the assessment, none of the trees examined on the

property were dissected, cored, probed, or climbed and detailed root crown examinations involving excavation were not undertaken.

While reasonable efforts have been made to ensure that the trees recommended for retention are healthy, no guarantees are offered, or implied, that these trees, or all parts of them will remain standing. It is professionally impossible to predict with absolute certainty the behaviour of any single tree or group of trees, or all their component parts, in all given circumstances. Inevitably, a standing tree will always pose some risk. Most trees have the potential to fall, lean, or otherwise pose a danger to property and persons in the event of adverse weather conditions, and this risk can only be eliminated if the tree is removed.

Without limiting the foregoing, no liability is assumed by NRSI or its directors, officers, employers, contractors, agents or Assessors for:

a) any legal description provided with respect to the Property;
b) issues of title and or ownership respect to the Property;
c) the accuracy of the Property line locations or boundaries with respect to the Property; and
d) the accuracy of any other information provided to NRSI by the Client or third parties;
e) any consequential loss, injury or damages suffered by the Client or any third parties, including but not limited to replacement costs, loss of use, earnings and business interruption; and
f) the unauthorized distribution of the assessment.

Third Party Liability

This assessment was prepared by NRSI exclusively for the Client. The contents reflect NRSI's best assessment of the trees situated on the Property in light of the information available to it at the time of preparation of this assessment. Any use which a third party makes of this assessment, or any reliance on or decisions made based upon this assessment, are made at the sole risk of any such third parties. NRSI accepts no responsibility for any damages or loss suffered by any third party or by the Client as a

result of decisions made or actions based upon the use or reliance of this assessment by any such party.

General

Any plans and/or illustrations in this assessment are included only to help the Client visualize the issues in this assessment and shall not be relied upon for any other purpose.

This report shall be considered as a whole, no sections are severable, and the assessment shall be considered incomplete if any pages are missing.

Appendix IV
Tree Data Summary Tables

Summary of Inventoried Trees

Common Name	Scientific Name	Excellent	Good	Fair	Poor	Very Poor	Dead	Total
Native Species								
American Basswood	*Tilia americana*		10	11				21
American Beech	*Fagus grandifolia*			1	1			2
American Elm	*Ulmus americana*			1	3	1	1	6
Balsam Fir	*Abies balsamea*			1				1
Black Cherry	*Prunus serotina*		2	2				4
Black Walnut	*Juglans nigra*	1	10	11				22
Common Hackberry	*Celtis occidentalis*		6	2				8
Eastern Cottonwood	*Populus deltoides*		9	11				20
Eastern White Cedar	*Thuja occidentalis*		2	2	1		1	6
Eastern White Pine	*Pinus strobus*		25	28	19	2	5	79
Freeman's Maple	*Acer x freemanii*		4					4
Green Ash	*Fraxinus pennsylvanica*		3	7	2	1	1	14
Hawthorn sp.	*Crataegus sp.*				1			1
Large-toothed Aspen	*Populus grandidentata*		1	1	1			3
Manitoba Maple	*Acer negundo*			9	2			11
Northern Red Oak	*Quercus rubra*		1	3				4
Red Maple	*Acer rubrum*		1					1
Red Pine	*Pinus resinosa*			3			6	9
Sugar Maple	*Acer saccharum*		39	32	3	1	2	77
Sweet Crabapple	*Malus coronaria*			2				2
Sycamore Maple	*Acer pseudoplatanus*		1					1
Trembling Aspen	*Populus tremuloides*		15	20	4	1	10	50
White Ash	*Fraxinus americana*		3	12	2	9	6	32
White Oak	*Quercus alba*		2					2
White Spruce	*Picea glauca*	4	95	106	29	6	7	247
Willow sp.	*Salix* sp.		3	3				6
Total		5	232	268	68	21	39	633
Amur Maple	*Acer ginnala*		3	1	1			5
Black Pine	*Pinus nigra*			2	1			3
Blue Spruce	*Picea pungens*	2	53	81	24	6		166
Chanticleer Pear	*Pyrus calleryana 'Chanticleer'*			1				1
Common Apple	*Malus pumila*		2	5	5			12
Common Pear	*Pyrus communis*			3				3
English Oak	*Quercus robur*		1					1
European Mountain-ash	*Sorbus aucuparia*		1		1		1	3
Japanese Maple	*Acer japonicum*		1					1

Common Name	Scientific Name	Excellent	Good	Fair	Poor	Very Poor	Dead	Total
Japenese Zelkova	*Zelkova serrata*		1					1
Little-leaf Linden	*Tilia cordata*		14	27	3	1		45
London Plane-tree	*Platanus × hispanica*			1				1
Maiden-hair Tree	*Ginkgo biloba*			1				1
Norway Maple	*Acer platanoides*		23	32	2	1		58
Norway Spruce	*Picea abies*		34	24	1			59
Sweet Cherry	*Prunus avium*			2	3			5
Thornless Honey Locust	*Gleditsia triacanthos* var. *inermis*		40	49	4			93
White Mulberry	*Morus alba*		5	10	3	1	2	21
White Willow	*Salix alba*			1				1
White Fir	*Abies concolor*		3	3	2			8
Bradford Pear	*Pyrus calleryana*		2					2
Other	Unknown						1	1
Total		2	183	243	50	9	4	491
Overall Total		**7**	**415**	**511**	**118**	**30**	**43**	**1124**

Overall Health of Trees Inventoried

Potential for Structural Failure Rating	Overall Condition						Total
	Excellent	Good	Fair	Poor	Very Poor	Dead	
Improbable	7	384	452	66	5	0	914
Possible	0	28	55	46	19	30	178
Probable	0	3	4	6	6	12	31
Imminent	0	0	0	0	0	1	1
Total	7	415	511	118	30	43	1124

Maps

481200 481400 481600 481800 482000

4724600 4724400 4724200 4724000

CATHERINE ST

CARLOW RD

Branch C

Branch A

Branch B

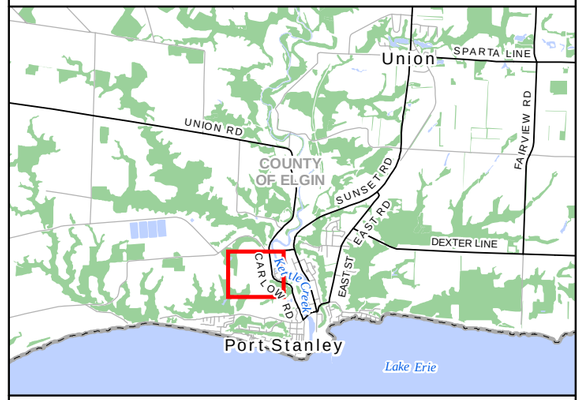
481200 481400 481600 481800 482000

Path: X:\2982_KettleCreekGC_PortStanley\NRSI_2982_Map1_TIPP_11x17_3K_2024_11_22_LRC.mxd

Map 1

Kettle Creek Golf Course

Tree Inventory and Preservation Plan



Legend

- Subject Property
- Inventoried Tree (Crown to Scale)
- Permanent Watercourse
- Intermittent Watercourse

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2982 Date: November 22, 2024	NAD83 - UTM Zone 17 Size: 11x17" **1:3,000**

0 40 80 120 160 Metres

N

Map 2a
Kettle Creek Golf Course
Port Stanley
Tree Inventory and Preservation Plan
COUNTY OF ELGIN
DEXTER LINE
COLBORNE ST
CARLOW RD
EAST ST
Port Stanley
Lake Erie
Legend
Inventoried Tree to be Retained (Crown to Scale)
Inventoried Tree to be Retained - Prune (Crown to Scale)
Inventoried Tree to be Removed (Crown to Scale)
Property Boundary
Proposed Site Plan
Existing Conditions
Wetland Boundary (NRSI July 21, 2023)
Dripline (NRSI December 14, 2023 and March 11, 2024)
Wetland Buffer (15m)
Dripline Buffer (10m)
Watercourse (Warm Water)
Watercourse Buffer (15m)
Tree Protection Fencing (TPF)
Natural Resource Solutions Inc.
Aquatic, Terrestrial and Wetland Biologists
Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Data provided by MNR© Copyright: King's Printer Ontario.
Project: 2982
Date: March 5, 2025
NAD83 - UTM Zone 17
Size: 24x36"
1:575
0 4 8 12 16 20 24 28 32 36 40 Meters
N
TOP OF SLOPE
EXISTING REGIONAL FLOOD LINE
BLOCK 89 0.3m reserve
BLOCK 88
15m WATERCOURSE BUFFER (NRSI)
15m WETLAND BUFFER (NRSI)
CENTRELINE OF STREAM ARE LIMITS OF PROPERTY
10m DRIPLINE BUFFER (NRSI 2024)
EX. POND
BLOCK 136 OPEN SPACE 1.22 Ha
PROPOSED REGIONAL FLOODLINE
PROPOSED SERVICE BLOCK AND PUBLIC PATHWAY
BLOCK 132 MEDIUM DENSITY 4.48 Ha
PROPOSED ONE STOREY TOWNHOMES
BLOCK 135 SWM
4m WIDE MAINTENANCE PATH
EX. POND
SNOW
MAIL
GATES
AMENITY SPACE
Excavation in this area to be completed under the supervision of a Certified Arborist.
Excavation in this area to be completed under the supervision of a Certified Arborist.
Existing gravel pathways adjacent to, or within TPF to be removed with care under the supervision of a Certified Arborist and renaturalized.


Map 2b
Kettle Creek Golf Course
Port Stanley
Tree Inventory and Preservation Plan
DEXTER LINE
COLBORNE ST
EAST ST
CARLOW RD
COUNTY OF ELGIN
Port Stanley
Lake Erie
Legend
Inventoried Tree to be Retained (Crown to Scale)
Inventoried Tree to be Retained - Prune (Crown to Scale)
Inventoried Tree to be Removed (Crown to Scale)
Property Boundary
Proposed Site Plan
Existing Conditions
Road
Dripline (NRSI December 14, 2023 and March 11, 2024)
Dripline Buffer (10m)
Watercourse (Warm Water)
Watercourse Buffer (15m)
Tree Protection Fencing (TPF)
Natural Resource Solutions Inc.
Aquatic, Terrestrial and Wetland Biologists
Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Data provided by MNR© Copyright: King's Printer Ontario.
Project: 2982
Date: March 5, 2025
NAD83 - UTM Zone 17
Size: 24x36"
1:575
0 4 8 12 16 20 24 28 32 36 40 Meters
N
BLOCK 131 MEDIUM DENSITY 0.65 Ha
BLOCK 133 PARKLAND
BLOCK 134 PARKLAND 0.02 Ha
BLOCK 138 NATURAL ENVIRONMENT 1.53 Ha
Existing gravel pathways adjacent to, or within TPF to be removed with care under the supervision of a Certified Arborist and renaturalized.
Excavation in this area to be completed under the supervision of a Certified Arborist.
Existing gravel pathways adjacent to, or within TPF to be removed with care under the supervision of a Certified Arborist and renaturalized.
Existing parking structure to be removed in entirety, and renaturalized within watercourse buffer.
RE-ALIGNED STORM WATE
DRIPLINE (NRSI 2023)
TTOM OF SLOPE
10m WOODLAND BUFFER (NRSI)
15m WATERCOURSE BUFFER (NRSI)
15m WATERCOURSE BUFFER (NRSI 2024)
Street B
Street C
Street D
Branch B
Branch C
EX. FH