Upper West Side Urban Boundary Expansion

Environmental Impact Study and Linkage Assessment

Prepared for:

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NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

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1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained by the Upper West Side Landowners Group (UWSLG) to complete an Environmental Impact Study (EIS), Linkage Assessment (LA), and Tree Protection Plan (TPP) in support of the proposed Urban Boundary Expansion (UBE) for lands in the Upper West Side (UWS) lands located in Hamilton, Ontario. The UWSLG is proposing the addition of 4 areas to the City of Hamilton's urban area lands classification. The subject sites are located directly south of Twenty Road West and are defined as; 'East A' and 'East B', 'Central' and 'West' Blocks. Map 1 shows the location and extent of these UBE Blocks. An Official Plan Amendment (OPA), EIS and LA, and TPP are required by the City of Hamilton for the proposed UBE, along with other planning and engineering studies provided by the project team. A private application for an UBE under the Ontario Growth Plan is allowable with associated costs outlined in the City of Hamilton Staff Report to Council, dated June 18, 2019: *Official Plan Amendment – Urban Boundary Expansion: Studies and Fees (PED19146) (City Wide)*. This EIS report has been developed by NRSI biologists and environmental analysts to address the requirement for an EIS and LA as part of the UWSLG UBE application.

In this report, the term 'subject sites' refers to the lands in the East A, East B, Central, and West Blocks (shown on Map 1). The term 'study area' refers to the subject sites and all adjacent lands within 120m of the subject site boundaries. This EIS report provides a characterization of the study area and includes an evaluation of natural heritage features, wildlife, and habitat through a background review and on-site field assessments. Natural features and elements are detailed and potential impacts associated with the change in land use proposed in the UBE are outlined. The TPP for the Central and East Blocks, prepared by NRSI Certified Arborists, is appended to this report; this TPP report will be updated to include the West Block following the completion of 2020 field surveys. The LA is included in this EIS and provides an analysis of the condition and ecological function for several City-mapped linkages overlapping with the study area (City of Hamilton 2013).

1.1 Project Scoping

1.1.1 Proposed Undertaking

The study area is located just outside the City of Hamilton's urban boundary and is designated as rural area lands. The proposed UBE seeks to add the East A, East B, Central, and West Blocks to the City of Hamilton's urban area. Should the City approve the applications for UBE, further studies and reporting (e.g. Secondary Plan, Draft Plan applications), and the ultimate

development will take into account the recommended mitigation measures outlined by this EIS and LA report. A description of the conceptual development proposal is provided later in this report. In general, the UWSLG is proposing residential land use in the UBE Blocks, along with a supporting road network and Natural Heritage System (NHS). The road alignment is currently going through an Environmental Assessment (EA) process that is integrated with the Garth Street Draft Plan of Subdivision. A preliminary submission for the Garth Street Draft Plan was provided to the City in July 2018.

1.1.2 Terms of Reference

A Draft Terms of Reference (TOR) for the EIS, LA, and TPP was prepared by NRSI and submitted to the City of Hamilton and the Niagara Peninsula Conservation Authority (NPCA) on May 14, 2020 for review and comment. The City and NPCA reviewed the Draft TOR, provided comments to NRSI regarding the proposed study approach on June 2, 2020 and June 5, 2020 (respectively), and will require revisions to the Draft TOR. The Draft TOR and the first round of comments from the City and NPCA are provided in Appendix I.

1.1.3 Collection and Review of Background Information

To determine a study approach for the EIS and LA, existing natural heritage information was collected and reviewed to identify key natural heritage features, habitats, and species that are reported from or have the potential to occur in the study area. Background information was gathered and reviewed from the following sources:

- Natural Heritage Information Centre (NHIC) database (MNRF 2020a, 2020b);
- City of Hamilton Urban Official Plan (UHOP) (2013);
- City of Hamilton Rural Official Plan (RHOP) (2012);
- Twenty Mile Creek Watershed Plan (NPCA 2006);
- City of Hamilton Natural Areas Inventory Project 3rd Edition (Hamilton Conservation Authority 2014);
- Airport Employment Growth District (AEGD) Subwatershed Study (Dillon Consulting Ltd. and Aquafor Beech Ltd. 2011);
- Airport Employment Growth District (AEGD) Subwatershed Study Implementation Document (Aquafor Beech Ltd. 2017);
- Federal Species at Risk Public Registry (Government of Canada 2019);

- Significant Wildlife Habitat Technical Guide (SWHTG) and Criteria Schedules for Ecoregion 7E (OMNR 2000, MNRF 2015a);
- Fisheries and Oceans Canada's aquatic species at risk mapping (DFO 2019);
- Ontario Breeding Bird Atlas (OBBA) (Bird Studies Canada et al. 2006);
- Ontario Reptile and Amphibian Atlas (ORAA) (Ontario Nature 2019);
- Atlas of the Mammals of Ontario (Dobbyn 1994);
- Ontario Butterfly Atlas (Macnaughton et al. 2019); and
- Ontario Odonata Atlas (OOAD 2019).

Initial species lists were compiled for wildlife reported in a 10km radius of the study area using the wildlife atlases listed above. The atlases provide data based on 10x10km survey squares; information on species from the square overlapping the study area (17HN88) was compiled. An initial desktop review of potential Species at Risk (SAR), Species of Conservation Concern (SCC), and Significant Wildlife Habitat (SWH) was completed to guide the scope of work and field surveys presented in this report.

Based on the initial species lists, several SAR and SCC have records of occurrence near the study area. SAR are those listed on the Species at Risk in Ontario List that forms Ontario Regulation 230/08 under the *Endangered Species Act,* 2007 (ESA). These include species identified by the Committee on the Status of Species at Risk in Ontario (COSSARO) as provincially Endangered or Endangered. These species are protected by the ESA, which includes protection of their habitat.

SCC are those identified as:

- 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. If these species are listed under the *Species at Risk Act* (SARA) under Schedule 1 they are protected by the federal Act, but not provincially by the ESA.

A desktop assessment was conducted to identify which SAR and SCC species have suitable habitat in the study area. This involved cross-referencing the preferred habitat for reported SAR and SCC against habitat characteristics that are present in the study area. This initial assessment ensures that the potential presence of all SAR and SCC in the study area is adequately assessed in this EIS. Full results of the SAR and SCC desktop assessment that incorporate the results of field surveys completed as of May 31, 2020 are provided in Appendix II.

The SWHTG is a guideline document that outlines the types of habitats that the MNRF considers significant in Ontario (OMNR 2000). Criteria to identify these habitats and their suitability are also defined by the province (MNRF 2015a). The SWHTG groups SWH into four broad categories: seasonal concentration areas, rare vegetation communities and specialized wildlife habitat, habitats of species of conservation concern, and animal movement corridors. Based on the results of the desktop assessment and field survey investigations completed by May 31, 2020, several confirmed and candidate SWH types occur in the study area (see Appendix III).

These SWH types are discussed further in the Existing Conditions section of this report, under Significant Wildlife Habitat. The full results of the SWH desktop assessment are provided in Appendix III.

2.0 Relevant Policies, Legislation, and Planning Studies

Information on the natural heritage features in the subject sites was collected and assessed for significance. These features are evaluated against the relevant policies, legislation, and planning studies described in the sections below to help inform the proposed UBE, identify areas to be protected, and identify areas that may require further study.

2.1 Provincial Policy Statement (2020)

The Provincial Policy Statement (PPS) (OMMAH 2020) is issued under the authority of Section 3 of the *Planning Act* and came into effect on May 1, 2020, replacing the 2014 PPS. Section 3 of the *Planning Act* requires that decisions affecting planning matters shall be consistent with policy statements under the Act. Part III of the PPS establishes that the PPS is to be read in its entirety and all relevant policies are to be applied to each situation. In this context, Section 2.1 of the PPS – Natural Heritage, establishes clear direction for the application of an ecosystem approach and the protection of 'significant' natural resources, as well as the form, function, and connectivity of natural features. These features are broadly defined in the PPS and rely on the MNRF and the municipality to identify and delineate specific natural features. The Natural Heritage Reference Manual (OMNR 2010) and the SWHTG and Criteria Schedules (OMNR 2000, MNRF 2015a) were prepared by the MNRF to guide the identification of natural features and interpretation of the Natural Heritage sections of the PPS.

In the UBE study area, natural features protected under the PPS include:

- The Upper Twenty Mile Creek PSW Complex;
- Fish habitat;
- Potential habitat for endangered and threatened species; and
- Confirmed and Candidate SWH.

These features are discussed in detail in this EIS. Policies found in the PPS that provide context to the current proposed development include the following:

- Section 2.1.1 of the PPS states that natural features and areas shall be protected for the long-term

- Section 2.1.2 of the PPS states that the diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of natural heritage

systems, should be maintained, restored or, where possible, improved, recognizing linkages between and among natural heritage features and areas, surface water features and ground water features.

- Section 2.1.3 of the PPS states that natural heritage systems shall be identified in Ecoregions 6E & 7E. The City of Hamilton has identified a Natural Heritage System (NHS) for the municipality, which is provided in the Urban Hamilton Official Plan (UHOP) (2013).

- Section 2.1.4 of the PPS states that development and site alteration shall not be permitted in significant wetlands in Ecoregions 5E, 6E, and 7E, or significant coastal wetlands.

- Section 2.1.5 of the PPS states that development or site alteration shall not be permitted in b) Significant Woodlands in Ecoregions 6E and 7E, and d) Significant Wildlife Habitat, or other types of significant habitat unless it has been demonstrated that there will be no negative impacts on the features or their ecological functions.

- Section 2.1.6 of the PPS states that development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements.

- Section 2.1.7 of the PPS states that development or site alteration shall not be permitted in habitat of Endangered or Threatened species except in accordance with provincial or federal requirements.

- Section 2.1.8 of the PPS states that development and site alteration shall not be permitted on adjacent lands in 120m of the natural heritage features and areas identified in policies 2.1.4, 2.1.5, and 2.1.6 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.

The Natural Heritage Reference Manual (OMNR 2010) provides technical guidance for implementing the natural heritage policies of the PPS. Although the Natural Heritage Reference Manual was based on the 2005 PPS, its guidance may be applied to the 2020 PPS. The manual represents the province's recommended technical criteria and guidance for identifying and protecting significant natural features as defined in the PPS.

The SWHTG was prepared to assist planning authorities and other participants in the land use planning system (OMNR 2000). The SWHTG is a detailed technical manual that provides information on the identification, description, and prioritization of SWH. The manual is intended for use in the municipal policy and development process under the *Planning Act*. An addendum to the SWHTG provides further detail on characterizing and identifying SWH in Ecoregion 7E (MNRF 2015a).

2.2 Endangered Species Act

The ESA (2007) prohibits killing, harming, harassing, or capturing SAR and protects their habitats from damage and destruction. The Committee on the Status of Species at Risk in Ontario (COSSARO) reviews and assesses species' populations and status'. Species designated as Threatened or Endangered, as well as their general or regulated habitats, receive legal protection under the ESA (2007).

Based on a desktop assessment, several SAR have the potential to occur in the study area, based on the habitats present. These include plants, birds, herpetofauna, mammals, insects, and fish (refer to the Existing Conditions, Wildlife sections below). A SAR and SCC desktop assessment was prepared as part of the background information review (see Appendix II).

2.3 Canadian Fisheries Act

The Canadian *Fisheries Act*, 1985 (amended in 2019) provides provisions for the protection of fish and fish habitat. Under the updated federal *Fisheries Act* fish populations are protected through two core prohibitions: Section 34.4(1) the death of fish by means other than fishing, and Section 35(1) the harmful alteration, disruption, or destruction of fish habitat (Government of Canada 2019). Any proposed work, undertaking, or activity should aim to avoid causing the death of fish, or the harmful alteration, disruption or destruction of fish habitat through the course or as a result of any proposed undertaking. 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"*.

Another important provision, Section 36 (3) states that no person shall deposit or permit the deposit of a deleterious substance of any type in water frequented by fish or in any place under any conditions where the deleterious substance, or any other deleterious substance that results from the deposit of the deleterious substance, may enter any such water. These 2 provisions

and the other habitat protection and pollution prevention sections of the *Fisheries Act* are meant to conserve and protect fish habitat.

The Department of Fisheries and Oceans (DFO) has developed guidelines for a proponent-led assessment to determine whether a project requires DFO review based on the type of water body where the work will occur, the nature of the proposed activity, and if following the Pathways of Effects will still result in potential residual effects to fish or fish habitat.

Aquatic features are present in the study area that have the potential to provide direct and indirect fish habitat. Proposed development in the UBE Blocks may therefore have implications under the federal *Fisheries Act*. A proponent-led self-assessment will be completed at future stages of the development when detailed information on the proposed activities potentially affecting fish or fish habitat is available. Potential impacts to fish and fish habitat from the proposed development are considered in this EIS.

2.4 Migratory Birds Convention Act

The federal *Migratory Birds Convention Act* (MBCA; 1994) is applied through The Regulations Respecting the Protection of Migratory Birds that states "[…] no person shall disturb, destroy or take a nest, egg […] of a migratory bird." Bird nests that are destroyed during construction and other related activities are referred to as "incidental take", which is illegal except under the authority of a permit obtained through the Canadian Wildlife Service (CWS). Implications of the MBCA may occur during the construction phase of the project when the subject sites are cleared and grubbed of vegetation. Impacts related to potential destruction of bird nests are discussed in the Impacts section of this EIS.

2.5 Greater Golden Horseshoe Growth Plan

The Growth Plan for the Greater Golden Horseshoe (GGH) came into effect May 16, 2019 (OMMAH 2019). Policies found in the GGH Growth Plan that provide context for the proposed UBE include the following:

Section 2.2.8.5. of the GGH Growth Plan states that a settlement area boundary expansion may occur in advance of a municipal comprehensive review, provided that:

a) The lands that are added will achieve at least the minimum density targets in policies 2.2.7.2 or 2.2.5.13, as appropriate;
b) The location of any lands added to a settlement area will satisfy the applicable requirements of policy 2.2.8.3;
c) The affected area is not rural settlement or in the Greenbelt Area;
d) The settlement area is serviced by municipal water and wastewater systems and there is sufficient reserve infrastructure capacity to service the lands; and
e) The additional lands and associated forecasted growth will be fully accounted for in the land needs assessment associated with the next municipal comprehensive review.

Section 2.2.8.6 of the GGH Growth Plan states that areas to be undertaken in the boundary expansion in policy 2.2.8.5, the amount of land to be added will be no larger than 40 hectares.

It is under these policies that the UWSLG has submitted their applications for urban boundary expansion. This EIS was prepared to support the UWSLG's applications.

The Growth Plan also includes a Natural Heritage System (NHS) that extends the Greenbelt NHS to all areas encompassed by the GGH Growth Plan, including the subject sites. Growth Plan NHS mapping was finalized in February 2018 and is made up of natural heritage features and areas (core areas) connected by natural corridors (linkages). The Growth Plan NHS was identified so that biological and geological diversity, natural functions, and ecosystems will be maintained. Natural cover, both land and water, make up 72% of the Growth Plan NHS. The Growth Plan NHS is available through the Natural Heritage Information Centre (NHIC) mapping database and has been accounted for in the identification of natural features (Cores and Linkages) in this EIS.

2.6 Hamilton Official Plans

The City of Hamilton's Rural and Urban Official Plans (UHOP and RHOP, respectively) outline current policies for the protection of natural features in the City of Hamilton. The proposed UBE subject sites are currently in the area regulated by the RHOP; however, the goal is to include these areas in the City's urban boundary. As such, both the RHOP and UHOP are discussed here, but the urban policies are applied for identifying natural features, Vegetation Protection Zones (VPZs) and potential impacts to natural features, wildlife and habitat.

2.6.1 Rural Hamilton Official Plan (2012)

General NHS Policies for the rural areas of the City of Hamilton are detailed in Section C.2.0 of the RHOP and the NHS is presented in Schedule B. As per Schedule B, Core Areas of the NHS are not present in the subject sites; however, linkages and Key Hydrologic Features (Streams) are present. As per Section C.2.2.3, minor refinements to boundaries of Core Areas and Linkages may occur through the completion of an EIS, watershed studies or other appropriate studies accepted by the city.

Section C.2.5 provides polices relating to the preservation and enhancement of Core Areas outside of the Greenbelt Plan Area, and states that the goal of these policies is to ensure that any development in or adjacent to Core Areas will not negatively impact their natural features or ecological functions. As it relates to the subject sites, no new development or alterations shall be permitted in fish habitats. Additionally, new developments or alterations are not permitted in PSWs, Significant Woodlands, Significant Valleylands and Significant Wildlife Habitat (SWH) or in lands adjacent to natural heritage features unless it can be demonstrated, through applicable studies, that no negative impacts on natural features or their ecological functions will occur. VPZs are outlined in Section C.2.5 as well. Information on aquatic habitat in the subject sites is provided in the Existing Conditions section and VPZs are discussed in the Mitigation section of this report. As per section 2.2.10, an EIS must be completed in accordance with Section F.3.2.1 of the RHOP.

Linkages are defined as natural areas on the landscape that connect Core Areas. Where new development or site alteration is proposed a Linkage Assessment must be completed. When an EIS is already being prepared the Linkage Assessment can be included as part of the EIS. Section F.3.2.2 of the RHOP provides a list of information that must be included in the Linkage Assessment.

In the subject sites there are two rural Site Specific Areas (SSAs), identified collectively as R-31. The boundaries of the SSAs are shown in Appendix A of the RHOP. In the R-31 areas, the RHOP policies (Volume 3, Chapter B Section R-31.1.0) stat that non-agricultural uses or urban uses are not permitted. The current UBE applications are being submitted to include these areas in the City's urban boundary with the ultimate goal to change the zoning on these lands. As such, the policies in the UHOP are also discussed here.

2.6.2 Urban Hamilton Official Plans (2013)

General NHS Policies for the urban areas of the City of Hamilton are detailed in Section C.2.2 of the UHOP and the NHS is presented in Schedule B. Since the subject sites are currently in areas regulated by the RHOP, the NHS outlined in the UHOP does not include the subject sites. Should the City accept the applications for UBE the policies in the UHOP will apply. As such, a summary of the applicable policies is provided here.

As outlined in Schedule B of the UHOP, Core Areas of the NHS are not present in the subject sites; however, linkages and Key Hydrologic Features (Streams) are present. As per Section C.2.2.2 of the UHOP, and as with Section C.2.2.3 of the RHOP, minor refinements to boundaries of Core Areas and Linkages may occur through the completion of an EIS, watershed studies or other appropriate studies accepted by the city. Additionally, Section C.2.2.8 of the UHOP states that all natural features require VPZs. VPZ policies are outlined in Section C.2.5.9 to C.2.5.13.

Section C.2.3 includes polices for the preservation and enhancement of Core Areas in the NHS and states that the goal of these policies is to ensure that any development in or adjacent to Core Areas will not negatively impact their natural features or ecological functions. Under Section 2.3.3, encroachment and vegetation removal in Core Areas is not permitted. Section 2.5 provides greater detail on requirements of the UHOP relating to Core Areas outside of the Greenbelt Plan Area. As it relates to the subject site, no new development or alterations shall be permitted in fish habitats. Additionally, new developments or alterations are not permitted in Significant Woodlands, Significant Valleylands and SWH or in lands adjacent to natural heritage features unless it can be demonstrated, through applicable studies, that no negative impacts on natural features or their ecological functions will occur. As per section C.2.6, an EIS must be completed in accordance with Section F.3.2.1 and comply with all provisions of Section C.2.5. of the UHOP.

Linkages are defined as natural areas in the landscape that connect Core Areas. Where new development or site alteration is proposed a Linkage Assessment must be completed. When an EIS is already being prepared the Linkage Assessment can be included as part of the EIS. Section C.2.7.6 of the UHOP provides a list of information that must be included in the Linkage Assessment.

2.7 Niagara Peninsula Conservation Authority Regulation 155/06 and Land Use Planning Policy Document

The Niagara Peninsula Conservation Authority Regulation 155/06 and Land Use Planning Policy Document (NPCA 2018) provides regulations for the development or interference with wetlands, watercourse, and shorelines in the jurisdiction of the NPCA. O. Reg 155/06 Section 2(1) states that "[…] no person shall undertake development or permit another person to undertake development in or on the areas in the jurisdiction of the Authority that are […] adjacent or close to the shoreline […], river or stream valleys […], hazardous lands […], wetlands, or other areas where development could interfere with the hydrologic function of a wetland". Sections 3(1) of the regulation states that the NPCA may grant permission to develop in the lands defined in Section 2(1), so long as "in its [the Authority's] opinion, the control of flooding, erosion, dynamic beaches, pollution or the conservation of land will not be affected by the development." Section 4(1) states that a signed application for permission to initiate development must be provided to the NPCA.

Section 5 of O.Reg. 155/06 states that "no person shall straighten, change, divert, or interfere with the existing channel of a river, stream or watercourse or change or interfere with a wetland in any way". This is specific to features regulated by the NPCA and may not include headwater drainage features in the subject sites. Section 6(1) of Regulation 155/06 includes a provision in which the NPCA may grant permission to straighten, change, divert, or interfere with an existing channel of a river, creek, stream, or watercourse or change or interfere with a wetland. As in Section 4(1), Section 7 states that a signed application for permission to undertake changes to watercourses and wetlands must be filed with the NPCA and provides a list of requirements for the application.

Several aquatic features and unevaluated wetlands are present in the study area. The proposed development may have implications for these features and prior to development the necessary applications will be filed with the NPCA and permissions acquired. Potential impacts to aquatic features and wetlands in and adjacent to the subject sites are considered in this EIS.

2.8 Additional Background Information

2.8.1 Twenty Mile Creek Watershed Plan

The Twenty Mile Creek Watershed Plan (NPCA 2006) provides an introduction to the physical, natural, and socio-economic character of the Twenty Mile Creek Watershed, in which the subject sites are located. The watershed plan defines the objectives of the watershed and provides a strategy to guide development, identify and recommend alternative and preferred restoration programs, and strengthen stewardship and partnerships in the watershed. Suitability mapping for different restoration projects is also provided in the plan and identifies areas in the watershed that would benefit most from restoration projects.

The Twenty Mile Creek Watershed is the second largest watershed in the NPCA's jurisdiction. The watershed falls within the City of Hamilton and the Regional Municipality of Niagara. The total drainage area of the watershed is 291 square kilometers. The Twenty Mile Creek Watershed contains five distinct subwatersheds. The subject sites are in the headwaters of the Twenty Mile Creek subwatershed. As per the Watershed Plan, headwater areas such as this would benefit from the protection and enhancement of PSWs and forested areas. The Twenty Mile Creek Watershed Plan recommends that all watercourses in the headwater areas be protected with a minimum 30m vegetated buffer on each side. Additionally, the use of erosion control measures should be enforced.

The Watershed Plan recommends the following overall management actions for the Twenty Mile Creek watershed:

- Planning and regulatory actions (e.g., Official Plan Amendments);
- Project opportunities on private and public lands (e.g., riparian buffer planting, wetland creation); and
- Areas requiring additional research and monitoring (e.g., ecological linkages, water temperature monitoring) in the watershed.

Further restoration measure suitability criteria and recommendations are provided in the Appendix of the Twenty Mile Creek Watershed Plan.

2.8.2 Airport Employment Growth District (AEGD) Subwatershed Study and Stormwater Master Plan (SWMP) (2017)

The Airport Employment Growth District (AEGD) EGD subwatershed area is unique in that it includes 4 watersheds (Welland River, Twenty Mile Creek, Sulphur Creek, and Big Creek) and

is under the jurisdiction of the NPCA, the Hamilton Conservation Authority (HCA), and the Grand River Conservation Authority (GRCA) (Dillon Consulting Ltd. and Aquafor Beech Ltd. 2011). The study area encompasses approximately 2,800ha of land and is bounded by Garner/Twenty Road to the north, Carluke Road East/White Church Road to the south Fiddler's Green Road to the west, and Upper James Street in the east.

The AEGD Subwatershed Study was prepared by Aquafor Beech Ltd. with the objective of protecting natural features in the subwatershed area and providing a limited range of employment related commercial uses to serve residents of the Secondary Plan area. The Subwatershed Study identified environmental constraints to development and opportunities for natural feature protection and enhancement in the AEGD area through scoped field studies, aerial reconnaissance, modeling, and monitoring. Three general components make up the AEGD Subwatershed Plan:

1) Natural Heritage Plan;
2) Groundwater Management; and
3) Surface Water Management.

The AEGD NHS includes Core Areas and Linkages and reflects the UHOP and RHOP NHS. The NHS plan provides guidance on the preparation of EISs for lands in or adjacent to the AEGD NHS.

The Groundwater Management plan identifies significant groundwater features, including recharge and discharge areas, defines water balance criteria that must be maintained during development and provides requirements for the protection of existing public and private wells in the study area.

The Surface Water Management plan identifies stream corridors requiring protection, defines stormwater management guidelines, and identifies potential end-of-pipe flood control facility locations.

Future study requirements are presented in Section 4.1 of the AEGD Subwatershed Plan; specifically, a detailed description of requirements for EISs as well as a checklist are provided in Section 4.1.1. An EIS is required when a development is proposed in or adjacent to a Core Area and a Linkage Assessment may be required for developments proposed in a Linkage. The EIS is to be prepared in accordance with the City of Hamilton's EIS Guidelines (City of Hamilton

2015a). The current EIS incorporates recommendations outlined in the AEGD Subwatershed Study and Stormwater Master Plan.

2.8.3 Airport Employment Growth District Draft Eco-Industrial Guidelines (2010)

The Eco-Industrial Guidelines (Dillon Consulting Ltd. et al. 2010) provide a set of sustainable design principles and measures to guide development in the AEGD area. The City's objective is to create a business park that can serve as a model for sustainable development. This document outlines criteria and measures to be applied for development in the AEGD.

An Energy and Environmental Assessment Report must be provided to demonstrate that the proposed development meets or exceeds the sustainability provisions of the Eco-Industrial Design Guidelines and Urban Design Guidelines. This report is to be evaluated by the City of Hamilton and degree of adherence to provisions may be used to prioritize development applications.

Specific eco-industrial design elements are presented in Section 2.0 of this document and have been grouped under 9 principles. These principles are as follow:

- Transportation;
- Energy, Renewables, Air Quality, and Greenhouse Gas Reduction;
- Water and Wastewater, and Water Conservation/Efficiency;
- Storm Water Management Guidelines;
- Materials, Resources, and Solid Waste;
- Economic Sustainability and Business Synergy;
- Social Sustainability;
- Site Development, Disturbance, Natural Corridors and Greenways; and
- Food Production and Community Gardening.

A brief description of each principle is provided in this document as well as a list of specific sustainable design measures to be implemented. The City will evaluate the application against these design principles and elements. An Energy and Environmental Assessment Report has been prepared by the subject sites, as per the list of required studies outlined in the Staff Report to Council (dated June 18, 2019): *Official Plan Amendment – Urban Boundary Expansion: Studies and Fees (PED19146) (City Wide).* This document is provided in the UBE application packages.

3.0 Field Methods

A comprehensive field program was completed in the Central and East Blocks between 2018 and 2019; the results of these surveys are included in this EIS. Field surveys in the West Block were initiated in 2020, and will continue until the end of the calendar year. This EIS includes information and data from the surveys completed in the West Block between January 1 and May 31, 2020. Surveys completed in the West Block from June 1, 2020 onwards will be included as part of a revised EIS at a later date. Several surveys are also planned in the Central and East Blocks for 2020, to supplement the 2018-2019 field program data. The future revised EIS will also contain updated data from these surveys and will reflect the field program outlined in the draft TOR (Appendix I).

Table 1 outlines all field surveys completed in the study area up to and including May 31, 2020, and describes survey details (i.e. date and time, level of effort, weather conditions on the date of survey, and the NRSI biologists that conducted each survey).

3.1 Terrestrial Field Surveys

Terrestrial field surveys were undertaken in the study area to characterize natural features and identify significant and sensitive natural heritage features and species that may be adversely affected by the proposed undertaking. Further, assessment of significant natural features and a variety of field surveys were undertaken, including:

- Multi-season vegetation inventories and Ecological Land Classification (Lee et al. 1998);
- Wetland delineation and verification with NPCA and City of Hamilton (MNRF 2014);
- Breeding bird surveys - point counts using standard OBBA call codes (OBBA 2001);
- Marsh bird breeding survey - point count using standard OBBA call codes at appropriate wetland locations (BSC 2009a);
- Anuran call surveys (BSC 2009b);
- Turtle emergence and basking surveys (MNRF 2015a);
- Turtle nesting habitat assessment (MNRF 2015a);
- Snake cover board surveys (MNRF 2016);
- Targeted insect area searches;
- Leaf-on and leaf-off bat cavity assessments (MNRF 2016, 2017);
- Winter wildlife surveys; and

- Significant Wildlife Habitat (SWH) feature identification and assessment (OMNR 2000, MNRF 2015b).

All surveys were conducted in accordance with provincial and local guidance documents as indicated above and in Table 1; in the absence of specific protocols for a survey type, professional experience and judgement was used by NRSI biologists. All surveys are described in detail in the following sections.

3.1.1 Vegetation Surveys

Vegetation surveys have been completed in the Central and East Blocks. In the West Block, these surveys did not take place before the May 31, 2020 cut-off date for this EIS.

Vegetation community delineation was completed initially using aerial photography and verified through investigations in the field. The standard Ecological Land Classification (ELC) System for southern Ontario was applied (Lee et al. 1998; 2008). Details of vegetation communities were recorded including species composition, dominance, uncommon species or features, evidence of human impact, and surficial soil characterization. During all subsequent surveys, ELC classification was refined as necessary.

A multi-season vegetation inventory was completed in the Central and East Blocks in 2018, including spring (May 28), summer (August 2), and fall (September 28) surveys. An update to the vegetation inventory was completed on June 10, 2019 in lands adjacent to the Central Block and East A Block subject sites, and supplemental information was added to the vegetation community species lists.

The wetland boundaries in the Central and East Blocks were flagged in the field by NRSI's Ontario Wetland Evaluation System (OWES) certified staff on July 30 and August 6, 2019. These boundaries were reviewed and field verified with NPCA's Ecologist (Lisa Price) and the City's Natural Heritage Planner (Melissa Kiddie) on August 8, 2019.

Table 1. Summary of Field Surveys

Date	Field Survey	Protocol	Time	Approx. Person Hours	Weather Conditions				Staff
					Air Temp. (°C)	Precipitation	Cloud Cover (%)	Wind (Beaufort Scale)	
2018 Terrestrial Field Surveys (Central and East Blocks)									
3 March, 2018	Winter Wildlife Survey	City of Hamilton Linkage Assessment Guidelines (2015b)	09:15-13:20	4.1	-2 to 1	None	0	2 to 3	D. Frey A. Cantwell
March 5 to 9, 13 to 15, 2018	Tree Inventory Bat Habitat Assessment (Leaf-off)	City of Hamilton Tree Protection Guidelines – City Wide (2010)	Approx. 9:30-16:30	Approx. 224 hours	-3 to +3	Light snow and snow flurries	0 to 100	1 to 4	J. Lance J. Bannon E. Bannon T. Brenton D. Stephenson D. Frey D. Riley A. Buse L. Knopf L. Hockley
May 28, 2018	Ecological Land Classification (ELC) Vegetation Inventory	Lee et. al 1998	09:30-14:30	10	24	None	0	3	P. Deacon K. Ellis
August 2, 2018			09:00-12:00	6	27	None	100	2	K. Ellis R. Young
September 28, 2018			12:00-15:30	3.5	12	None	5	1	B. Woodman
April 24, 2018	Anuran Call Survey	BSC 2009b	20:30-22:15	7	10.5	Light rain	100	1	D. Frey A. Cantwell L. Hockley S. Hofstetter
May 28, 2018			21:30-23:00	6	23	None	20	0	A. Reinert S. Hofstetter K. Martin R. Young
June 20, 2018			20:30-23:00	10	19.5	None	60	0	D. Frey J. Bannon J. Pickering T. Larking

Date	Field Survey	Protocol	Time	Approx. Person Hours	Weather Conditions				Staff
					Air Temp. (°C)	Precipitation	Cloud Cover (%)	Wind (Beaufort Scale)	
April 30, 2018	Snake Cover Board Survey	MNRF 2016	12:45-17:15	13	19	None	0	2	D. Frey N. Schueder
May 7, 2018			9:50-16:30	13.4	14.5	None	<1	6	J. McCarter J. Pickering
May 28, 2018			09:45-14:15	9	24 to 29	None	0 to 10	3	P. Deacon K. Ellis
June 4, 2018			07:30-10:30	9	16	None	80	3	T. Brenton K. Martin C. Poulsen
June 28, 2018			06:15-10:00	15	18	Fog	100	0	E. Gosnell J. Pickering T. Larking R. Young
August 2, 2018			09:15-13:45	9	27	None	100	2	K. Ellis R. Young
June 4, 2018	Breeding Bird Surveys	OBBA 2001	06:15-09:30	9.75	15	None	100	3 to 4	T. Brenton K. Martin C. Poulsen
June 28, 2018			06:00-08:30	10	18	Fog	100	0 to 1	E. Gosnell J. Pickering T. Larking R. Young
May 7, 2018	Bat Habitat Assessment (Leaf-off)	OMNR 2011, MNRF 2017	08:45-16:30	15.5	11.5	None	<1	6	J. McCarter J. Pickering
2019 Aquatic Field Surveys (Central and East Blocks)									
April 3, 2019	Headwater Drainage Feature Assessment	Ontario Stream Assessment Protocol (V10.S4.M11) Unconstrained Headwater	09:00-17:00	24	3 to 7	None	70	3 to 4	G. MacVeigh A. Cantwell A. Baril (Geomorphix)
June 8, 2019			09:30-16:30	14	16 to 20	None	60	2	D. Frey A. Cantwell

Date	Field Survey	Protocol	Time	Approx. Person Hours	Weather Conditions				Staff
					Air Temp. (°C)	Precipitation	Cloud Cover (%)	Wind (Beaufort Scale)	
August 15, 2019		Sampling (Gorenc and Stanfield 2017)	08:00-17:00	36	22	None	50 to 100	1	D. Frey A. Cantwell J. Pickering A. Baril (Geomorphix)
April 3, 2019	Aquatic Habitat Assessment	Modified Ontario Stream Assessment Protocol	09:00-17:00	24	3 to 7	None	70	3 to 4	G. MacVeigh A. Cantwell A. Baril (Geomorphix)
August 15, 2019			08:00-17:00	36	22	None	50 to 100	1	D. Frey A. Cantwell J. Pickering A. Baril (Geomorphix)
2019 Terrestrial Surveys (Central and East Blocks)									
July 16, 2019	Insect Survey	In the absence of a specific protocol to conduct these surveys professional experience and judgement was used by NRSI biologists.	10:30-13:15	5.5	29	None	0 to 80	0 to 1	C. Teat D. Frey
August 16, 2019			09:30-13:00	10.5	20	None	80	1	C. Teat D. Riley M. Zago
August 6, 9, 13, 16, 19, 20, September 11, 17, 19, 2019	Tree Inventory	City of Hamilton Tree Protection Guidelines – City Wide 2010	Approx. 09:00-16:30	217.5	12 to 28	None and light rain	0 to 100	0 to 3	K. Ellis J. Lance T. Brenton J. Bannon J. Pickering M. Zago D. Riley O. Foster M. Heyming J. Phillips

Date	Field Survey	Protocol	Time	Approx. Person Hours	Weather Conditions				Staff
					Air Temp. (°C)	Precipitation	Cloud Cover (%)	Wind (Beaufort Scale)	
July 30, 2019	Wetland Delineation Flagging	MNRF 2013	09:00-17:00	16	25	None	10	2	K. Richter J. Pickering
August 6, 2019			09:00-17:00	16	24	None	80	2	K. Richter M. Heyming
August 8, 2019	Wetland Boundary Review and Verification	MNRF 2013	08:00-17:00	27	24	Light rain	80	2	K. Richter J. Pickering M. Heyming
June 10, 2019	Ecological Land Classification (ELC) Vegetation Inventory Turtle Nesting Habitat Assessment	Lee et al. 1998	08:00-18:00	10	23	Rain at 16:30	80-100	1	P. Deacon
June 17, 2019	Snake Cover Board Survey	MNRF 2016	07:45-11:45	4	16	None	60-90	2	T. Brenton
June 17, 2019	Marsh Breeding Bird Survey	BSC 2009a	07:00-09:00	2	14	None	60	0	T. Brenton
2020 Aquatic Surveys (West Block)									
April 2, 2020	Headwater Drainage Feature Assessment	Ontario Stream Assessment Protocol (V10.S4.M11) Unconstrained Headwater Sampling (Gorenc and Stanfield 2017)	10:00-18:30	17	14	None	10	2	D. Frey H. Fotherby
May 22, 2020			09:45-18:00	16.5	21	None	10	1	D. Frey A. Reinert
2020 Terrestrial Surveys (West Block)									
February 11, 2020	Winter Wildlife Survey	In the absence of a specific protocol	08:45-11:00	4.5	0	None	80-100	1	D. Frey A. Cantwell

Date	Field Survey	Protocol	Time	Approx. Person Hours	Weather Conditions				Staff
					Air Temp. (°C)	Precipitation	Cloud Cover (%)	Wind (Beaufort Scale)	
March 1, 2020		to conduct these surveys professional experience and judgement was used by NRSI biologists.	12:00-13:00	2	-1	None	10	3	D. Riley A. Reinert
April 27, 2020	Anuran Call Survey	BSC 2009b	21:45-22:30	1.5	7	None	60	1	D. Frey H. Fotherby
May 26, 2020			21:15-22:15	2	22	None	10	0	G. MacVeigh S. Burgin
April 6, 2020	Turtle Emergence and Basking Surveys	Modified Visual Encounter Surveys based on the Survey Protocol for Blanding's Turtle (*Emydoidea blandingii*) in Ontario (MNRF 2015)	14:00-15:30	1.5	18	None	5-10	1-2	D. Frey
April 25, 2020			14:00-15:30	1.5	13	None	10-20	3-4	D. Frey
May 6, 2020			13:30-16:00	5	13	None	20-40	2-3	C. Teat E. Voogjarv
May 13, 2020			13:45-15:00	2.5	15	None	0	2	R. Archer S. Turner
May 22, 2020			09:30-11:00	1.5	22	None	5-15	2	J. McCarter
May 25, 2020			10:15-11:00	1.5	26	None	5	3	H. Fotherby J. McCarter
April 27, 2020	Artificial Cover Object (ACO) Surveys	Survey Protocol for Ontario's Species at Risk Snakes (MNRF 2016)	19:00-19:45	1.5	15	None	20	3	D. Frey H. Fotherby
May 6, 2020			14:00-16:45	5.5	13	None	40	2	C. Teat E. Voogjarv
May 12, 2020			15:00-16:30	3	8	None	80	3	C. Teat S. Hofstettor
May 13, 2020			13:30-15:15	3.5	12	None	0	2	R. Archer S. Turner
May 22, 2020			09:30-11:30	2	21.5	None	15	2	J. McCarter

3.1.2 Tree Inventory

A comprehensive inventory of trees ≥10cm in Diameter at Breast Height (DBH) on and within approximately 3m of the Central and East Blocks was completed by NRSI's Certified Arborists in March 2018, and August-September 2019. Trees inventoried in 2018 were reported on in the *Upper West Side Draft Plan of Industrial Subdivision: Tree Protection Plan* (NRSI 2018); they are presented on maps in Appendix IV but are discussed under separate cover in the 2018 report. In the West Block, the tree inventory did not take place before the May 31, 2020 cut-off date for this EIS.

Individual trees that were ≥10cm in DBH were tagged with a pre-numbered aluminum forestry tag and assessed by a Certified Arborist; off-property and boundary trees were not tagged because they are not wholly UWSLG's property. Trees that were not tagged were assigned an alpha-identifier to distinguish them on project maps (Appendix IV). The location of each inventoried tree in the subject sites was surveyed using an SXBlue II GNSS GPS unit by the Certified Arborist. The 2019 tree inventory dataset and summary tables, as well as mapping of each inventoried tree on and adjacent to the Central and East subject sites is provided in the Upper West Side Urban Boundary Expansion Central and East Blocks Tree Protection Plan, attached to this report (Appendix IV).

The following information was recorded for each inventoried tree:

- Tag number (where applicable);
- Species (common and scientific name);
- DBH measurement (cm);
- Crown radius (m);
- General health (good, fair, poor, dead) (City of Hamilton 2010);
- Potential for structural failure (improbable, possible, probable, imminent);
- Tree location (e.g. subject site); and
- General comments (i.e. disease, aesthetic quality, development constraints).

3.1.3 Bird Surveys

The bird surveys described in the following sections have been completed in the Central and East Blocks. In the West Block, these surveys did not take place before the May 31, 2020 cut-off date for this EIS.

Breeding Bird Surveys

Breeding bird surveys were completed on June 4, and June 28, 2018, and data was recorded using standard OBBA call codes (OBBA 2001). Surveys consisted of 10-minute point counts at 4 locations in the study area. These locations were selected to account for a variety of habitat types (ELC communities) present in the study area (Map 2). Breeding bird surveys were also conducted outside of the study area, including 5 additional stations that are not discussed in this EIS. Breeding bird surveys occurred between dawn and 1000hrs. All birds observed, as well as the highest level of breeding evidence exhibited for each species, were recorded by an avian biologist.

Marsh Bird Breeding Surveys

A single marsh bird breeding survey was conducted on June 17, 2019 and data was recorded using standard OBBA call codes (OBBA 2001). Similar to breeding bird surveys, this targeted marsh bird survey consisted of 10-minute call-playback point counts completed where suitable marsh habitat was present in the study area (BSC 2009a). These point count stations are shown on Map 2. Marsh bird breeding surveys occurred between dawn and 1000hrs. All birds observed, as well as the highest level of breeding evidence exhibited for each species, were recorded by an avian biologist.

3.1.4 Herpetofauna Surveys

Herpetofauna surveys have been completed in the Central and East Blocks. In the West Block, several surveys targeting turtles and snakes were completed before the May 31, 2020 cut-off date for this EIS. Additional herpetofauna surveys are planned for the study area in 2020, and will be presented as part of the future revised EIS.

Surveys targeting amphibians and reptiles were conducted to gather information for the assessment of species present in the study area, candidate SWH, SAR/SCC potentially present, wetland function, and headwater drainage feature (HDF) function. Features with breeding amphibians or with other important life-cycle habitats (movement corridors, stepping stone habitat, nesting habitat, basking habitat, etc.) for various herpetofauna species have a more important terrestrial function than features that do not contain these habitats.

3.1.4.1 Anuran Call Surveys

Evening anuran call surveys were conducted on April 24, May 28, and June 20, 2018 for features in the Central and East Blocks, and on April 27 and May 26, 2020 for features in the

West Block. These surveys followed the methods outlined in the Marsh Monitoring Program (BSC 2009b). Monitoring station locations are shown on Map 2, with 6 occurring in the study area. All calling anurans heard during 3-minute call counts in a 100m radius were recorded to species and included an estimate of call intensity and number of individuals present. At each station, the survey time, air and water temperature, wind speed, and cloud cover were recorded.

3.1.4.4 Turtle Emergence and Basking Surveys

The small pond in the eastern part of the West Block (Pond 1), and the large pond located in the naturalizing orchard just outside of the study area east of the Central Block (Pond 2), may provide overwintering habitat for turtles.

Modified visual encounter surveys based on the Survey Protocol for Blanding's Turtle (*Emydoidea blandingii*) in Ontario (MNRF 2015) targeting emerging and basking turtles of all species were conducted in 2018 (Pond 2) and 2020 (Pond 1) between April and June, once air temperatures were suitably warm. The first survey of each year was timed to document turtles emerging from their overwintering habitat, whereas all subsequent surveys focused on observing turtles basking and using the ponds. In total, 6 surveys were completed for each pond; surveys for Pond 1 within the West Block were completed by the May 31, 2020 cut-off date for this EIS and the results are therefore discussed in this report.

During surveys, biologists approached each pond quietly and walked the perimeter of the feature, scanning the open water and shoreline with binoculars to avoid disturbing any turtles that may have been using the area. Surveys were conducted on sunny, warm days; NRSI biologists also watched for turtles during all site visits within the study area. During each visual encounter survey detailed notes were taken that described the habitat searched, level of effort, weather conditions, and species observed.

3.1.4.4 Turtle Nesting Habitat Assessment

Where potential overwintering habitat is present, turtles may nest in suitable adjacent habitats within approximately 100m. A 100m-radius from the pond located south of the Central Block, confirmed as turtle overwintering habitat in 2018, overlapped with the study area considered in this EIS. On June 10, 2019, an NRSI biologist surveyed the candidate turtle nesting areas around the pond to determine if exposed, loose mineral (sand and gravel) soil areas were present where turtles may nest. No suitable turtle nesting habitat was observed. Soils were generally too wet, and local topography within 100m of this offsite pond was low lying, thereby

promoting moist conditions that are not suitable for turtle nesting. Based on the absence of suitable habitat, no further surveys for nesting turtles were completed in the area.

Turtle nesting habitat assessments are scheduled in 2020 for the West Block but did not take place before the May 31, 2020 cut-off date for this EIS.

3.1.4.5 Snake Cover Board Surveys

Snake cover boards were installed in all 3 UBE Blocks on April 23, 2018 (Central and East Blocks) and April 25, 2020 (West Block); board locations are shown on Map 2. Each board measured 4ft x 4ft with the upper surfaces painted black to absorb heat. Prior to the placement of each board, an area of vegetation similar in size to the board was removed to expose bare soil at the time of placement. Snake cover boards were checked in the morning or late evening when conditions were most appropriate to observe snakes basking beneath the boards. When checking boards, biologists approached the board cautiously and lifted it to check for snakes underneath, taking care to replace the board in its original location. All snake species, sex (if known), number of individuals, and behaviour were recorded on a detailed observation form. Photo records were also collected when possible. Several cover board checks were completed in 2018 and in 2020 prior to the May 31, 2020 cut-off date for this EIS. Additional board checks in all UBE blocks are planned for the remainder of the 2020 snake active season, and will be presented as part of the future revised EIS.

3.1.5 Insect Surveys

Targeted visual encounter surveys for butterflies, odonates, and bees were conducted in the Central and East Blocks in July and August 2019. Surveys consisted of area searches in a variety of suitable habitats in the study area. Surveys occurred between 0930hrs and 1315hrs during suitable weather conditions (i.e. sunny, warm [>20ºC], low wind [<4 Beaufort Scale], and no precipitation). Species that could not be identified on the wing were captured using an aerial insect net, identified if possible or described in detail, and released. During each survey, detailed notes were taken that described the habitat searched, level of effort, weather conditions, species observed, and number of individuals. Notes were also taken on any habitat associations (e.g. nectaring or ovipositing on specific plants), larva, pupa, etc. There is no specific survey protocol for conducting insect surveys. As such, NRSI biologists used their professional experience and judgement to set out the methods described above.

Insect surveys are scheduled in 2020 for the West Block but did not take place before the May 31, 2020 cut-off date for this EIS.

3.1.6 Bat Habitat Assessment

For the Central and East Blocks, leaf-off bat habitat assessments were conducted in early May 2018 to assess the isolated trees, hedgerows, orchard areas, and buildings in the study area for their potential to provide habitat for 3 SAR bats that are reported from the study area (see Appendix II). Bat habitat assessments were completed concurrently with the tree inventory or as part of separate surveys. NRSI's Certified Arborists or biologists visually scanned all trees ≥10cm DBH for the presence of features (i.e. cavities, loose bark, etc.) that may provide cavity-roosting bat habitat. The location of all oak and maple trees within the study area was also documented during the tree inventory, since these trees may provide habitat for the leaf-cluster-roosting SAR, Tri-colored Bat (*Perimyotis subflavans*).

All NRSI's Certified Arborists and biologists are trained and experienced in conducting bat habitat assessments using the MNRF's *Use of Buildings and Isolated Trees by Species at Risk Bats Survey Methodology* (2014) and *Survey Protocol for Species at Risk Bats in Treed Habitats* (2017). Information considered (and recorded, where applicable) for cavity trees included the following:

- Tree species;
- Location;
- DBH;
- Canopy cover;
- Tree height, decay class according to Watt and Caceres (1999); and
- Number of potentially suitable cavities.

Other criteria were also considered, including the use of cavities by other wildlife, the potential for cavities to be used by predators, supporting/surrounding habitat, and other characteristics that may contribute to the habitat requirements of these species, such as temperature regulation.

Bat habitat assessments are scheduled in 2020 for the West Block but did not take place before the May 31, 2020 cut-off date for this EIS.

3.1.7 Winter Wildlife Survey

Surveys were conducted in 2018 (Central and East Blocks) and 2020 (all UBE Blocks) by NRSI biologists to inventory wildlife tracks and movement corridors in the study area. Site visits were

conducted when snow cover was present at a depth sufficient for the observation of wildlife tracks. The winter wildlife survey allowed NRSI biologists to identify mammal species that are using the study area by their tracks, including those of crepuscular, nocturnal, and secretive species not typically observable during other surveys. Concentrations of wildlife tracks and potential movement corridors were identified and mapped.

Natural areas that may provide an ecological linkage function were assessed during this survey. The following parameters were collected for each potential linkage area:

- Width (m);
- Percent cover (%);
- General vegetation community characteristics;
- Evidence of wildlife (tracks, scat, vocalizations, etc.); and
- Overall habitat quality and evidence of habitat disturbance (e.g. road barriers, traffic noise, presence of residential buildings, hiking trails).

NRSI biologists also used field data collected in all relevant natural areas throughout the subject sites between 2018 and 2020 to understand how wildlife are using habitats in the study area.

3.1.8 Other Wildlife Observations

All observations of birds, herpetofauna, mammals, insects, and fish were documented on all field visits completed to date. This included direct observations of individuals, as well as signs of wildlife presence (i.e. tracks, scats, dens, nests etc.), and anecdotal observations from tenants and landowners in the study area.

3.2 Aquatic Surveys

NRSI aquatic biologists conducted several visits to the study area between 2018 and 2020. Surveys targeting the ecological and hydrological function and character of aquatic features in the study area were completed. The methods used for these surveys are described in further detail in the following sections. The majority of aquatic features meet the definition of an HDF as per the *Evaluation, Classification and Management of Headwater Drainage Features Guidelines* (TRCA and CVC 2014) document (Headwater Guideline):

"*Non-permanently flowing drainage feature that may or may not have defined bed or banks; they are first-order or zero-order intermittent and ephemeral channels, swales, and connected headwater wetlands, but do not include rills or furrows"*

Aquatic surveys have been completed in the Central and East Blocks. In the West Block, several surveys targeting aquatic features were completed before the May 31, 2020 cut-off date for this EIS. Additional aquatic surveys are planned for the study area in 2020, and will be presented as part of the future revised EIS.

3.2.1 Aquatic Habitat Assessments

NRSI aquatic biologists conducted 2 site visits in 2019 to assess aquatic habitat of the HDFs in the Central and East subject sites. To characterize aquatic habitats, the following information was recorded for each HDF:

- Substrate type;
- Channel depth, width, etc., if applicable;
- Riparian zone conditions;
- Surrounding land use;
- Bank stability;
- Aquatic vegetation cover;
- Instream habitat features; and
- Critical life stage areas (i.e. spawning, nursery habitat, etc.), if present.

Aquatic biologists walked the entire length of each major feature that crosses in the study area to characterize the potential for seeps and springs, significant wildlife, and barriers to fish movement and connectivity. Information on the condition and connectivity of downstream features, outside of the subject site, was also gathered but was limited due to land access restrictions. In addition, all features were assessed for their potential to provide suitable habitat for Grass Pickerel (*Esox americanus vermiculatus*), a SCC and regionally rare species that is reported from downstream reaches of Twenty Mile Creek, outside of the study area (DFO 2019).

3.2.2 Headwater Drainage Feature Assessment

HDFs were identified in the study area through the AEGD Subwatershed Study (2017), review of aerial photos, previous site visits, and available mapping. The subject sites contain 6 major HDFs, as well as several smaller mapped features. Staff from NRSI and GEO Morphix Ltd. conducted HDF surveys according to the methods outlined in the Headwater Guideline and the Ontario Stream Assessment Protocol (OSAP) (V10.S4.M11) *Unconstrained Headwater Sampling* module (Gorenc and Stanfield 2017).

The headwater features in the study area were organized into functional units (i.e. branches) that are loosely defined as tributaries, draining towards Twenty Mile Creek. Within the UBE study area 6 distinct branches occur, TTMC3, TTMC5, TTMC6, TTMC7, TTMC8, and TTMC11.

Each HDF was subdivided into reaches by GEO Morphix Ltd. prior to surveys. These reaches were identified based on changes to riparian conditions, channel morphology, and tributary confluences and were subsequently verified in the field. Each reach was given a unique identifier as indicated below and in the Existing Conditions section:

Stream Name (TTMC)–HDF Code (#)–Reach Code (#-#)

The Stream Name refers to the Tributaries of Twenty Mile Creek (TTMC); the Stream Code references a unique headwater number (3 to 11); and the Reach Code refers to each reach surveyed along the HDF. Where a branch of the feature occurs, an additional number is added to the end of the Reach Code.

Data was collected for each reach including the following:

- Feature type;
- Riparian conditions;
- Flow conditions;
- Feature vegetation;
- Feature and bankfull widths and depths;
- Sediment deposition and transport;
- Flow measurements (if applicable);
- Site features; and
- Channel connectivity.

Three site visits were conducted to capture the early spring high water table conditions (April)), late spring conditions before fields were ploughed and planted (May to early June), and summer conditions (July to August).

Following the field surveys, the collected data was assessed using the criteria outlined in the Headwater Guideline. Each reach was reviewed and assigned a classification for each of 4 categories: Hydrology, Riparian Condition, Fish and Fish Habitat, and Terrestrial Habitat. For each reach, the four categories were classified as either Important, Valued, Contributing or Limited depending on field observations. For the Hydrology category, the fourth classification is

‘Recharge Function’, rather than ‘Limited Function’. These classifications were then run through the decision matrix provided in the Headwater Guideline to determine a recommended management strategy. Where appropriate, the recommended management strategy was altered based on site specific information that is not accounted for through the Headwater Guideline.

The management strategy for the reaches within the Central and East Blocks based on 2019 surveys is shown on Map 3; following the ongoing re-assessment of these reaches in 2020, management strategies may be revised. In the West Block, the first 2 HDF surveys were completed before the May 31, 2020 cut-off date for this EIS. Management strategies for the reaches within this block will be presented as part of the future revised EIS once the full suite of surveys is complete.

4.0 Existing Conditions

4.1 Soil, Terrain and Drainage

The subject sites are located in the Twenty Mile Creek watershed, which is under the jurisdiction of the NPCA. The Twenty Mile Creek watershed drains a catchment of approximately 291km^2 (NPCA 2006) and contains 5 subwatersheds, including the Main Channel of Twenty Mile Creek, Gavora Ditch, Spring Creek, North Creek, and Sinkhole Creek. The study area is located in the Main Channel Twenty Mile Creek subwatershed in the headwaters of Upper Twenty Mile Creek. The physiography of the area is characterized by gently undulating clay plains (NPCA 2006).

The topography of the study area is gently undulating, ranging from an elevation of approximately 234 meters above sea level (masl) to approximately 222masl (exp 2018). The subject sites slope gradually to the northeast (exp 2018). Surface runoff from the study area generally flows northeast via several HDFs toward tributaries of Twenty Mile Creek before entering Twenty Mile Creek proper northeast of the study area.

Physiographically, the study area is in the northern portion of the Haldimand Clay Plain region, which is characterized as a stratified clay plain that has a heavy texture and low drainage (Chapman and Putnam, 1984). The study area is specifically located in a trough between two low-relief till moraines, which direct surface water along the generally eastwardly sloping plain between the features (Chapman and Putnam, 1984). The surficial geology of the study area is composed of fine-textured glaciolacustrine deposits consisting of massive to well laminated silt and clay, with minor sand and gravel (OGS 2010). The quaternary geology is consistent with surficial conditions, and is described as silt and clay, with minor sand, basin and quiet water deposits (OGS 2010).

The study area consists of Beverly Silt Loam, Brantford Silt Loam, and underlying bedrock of light-gray buff-colored dolomites in the Guelph formation (OGS 2011). Regions of carbonate rock were identified as susceptible to karstification (exp 2018). The soils in the subject sites provide good to imperfect drainage. Portions of the subject sites have groundwater discharge potential and have low to medium vulnerability to groundwater contamination (NPCA 2006). Regional groundwater flow across the study area is generally directed northwards towards Lake Ontario (located ~2km northeast of the subject site). Locally, shallow groundwater discharges to Twenty Mile Creek, although a portion of this shallow groundwater is interpreted to seep downwards into the regional aquifer system.

4.2 Designated Natural Areas

4.2.1 Significant Woodlands

The RHOP and the PPS define Significant Woodlands as “those areas that are ecologically important based on the following:

a) Features such as species composition, age of trees, stand history;
b) Functional importance due to their contribution to the broader landscape because of location, size, or due to the amount of overall forest cover in the planning area; and
c) Economically important due to site quality, species composition or past management history.

The City of Hamilton identifies Significant Woodlands using a set of criteria (see Table 2). Any woodland that meets 2 or more of these criteria is considered significant. The criteria were developed by City of Hamilton staff in conjunction with 4 Conservation Authorities in the municipality.

The AEGD Subwatershed Study (2017) identifies Significant Woodland in the UBE study area, including a feature southeast of the East B Block and another feature occurring within the with the southwest corner of the West Block. Other features mapped as Significant Woodlands are present within the overall Upper West Side lands (as shown on Map 1) but are not discussed in this EIS since they do not overlap with the defined study area.

4.2.2 Provincially Significant Wetlands

The RHOP, UHOP and the PPS define PSW’s as those wetland areas “identified as provincially significant by the MNRF using evaluation criteria established by the Province, as amended from time to time”. A small portion of the Upper Twenty Mile Creek PSW Complex is located adjacent to the East B Block subject site, to the east. The western boundary of this PSW unit was delineated by NRSI biologists, and field verified by NPCA’s biologist (Lisa Price) and the City’s Natural Heritage Planner (Melissa Kiddie) on August 8, 2019.

The Upper Twenty Mile Creek PSW Complex joins the Lower Twenty Mile Creek PSW Complex (east of Highway 56) to form a protected area along the entire length of Twenty Mile Creek. The locally significant Rymal Road Wetland Complex is also present to the north of the study area.

Table 2. Criteria for Significant Woodlands (City of Hamilton 2013)

Criterion	Description	
Size	The minimum size criteria are presented below.	
	Forest Cover (by watershed-urban and rural portions)	*Minimum patch size for significance*
	<5%	1 ha
	5-10%*	2ha
	11-15%	4ha
	16-20%	10ha
	21-30%	15ha
Interior Forest	Interior forest habitat is defined as 100m from edge	
Proximity/Connectivity	Woodlands located within 50m of a significant natural area (defined as wetlands 0.5ha or greater in size, ESAs, PSWs, and Life Science ANSIs)	
Proximity to Water	Woodlands where any portion is within 30m of any hydrological feature, including all streams, headwater areas, wetlands, and lakes	
Age	Woodlands with trees of 100 years or more in age	
Rare Species	Woodlands containing threatened, endangered, special concern, provincially or locally rare plant or wildlife species	

***The NPCA reports that the Upper Twenty Mile Creek watershed has 10% Forest Cover (2007-2011) (NPCA 2006)**

4.3 Vegetation

4.3.1 Vegetation Communities

The majority of the study area consists of agricultural fields and hedgerows with several HDFs, meadow marsh wetlands, and naturalizing orchard and golf course areas. A summary of ELC communities identified in the study area is provided in Table 3. ELC communities are shown on Map 4. Hedgerows are present throughout the subject site and provide numerous corridors of natural cover between the existing natural features. Hedgerow features are indicated on Map 4 but are not assigned specific ELC vegetation community codes. Full details on the composition and character of the vegetation communities in the study area is provided below.

Table 3. Vegetation Communities Identified in the Study Area

ELC Code	ELC Description	Environmental Characteristics
Cultural		
Res	Residential	Abandoned dwellings are present in the Central and East 'B' Blocks. These areas are characterized by some scattered trees, and overgrown but anthropogenically disturbed grounds with debris and old farm equipment throughout. An abandoned golf course clubhouse facility, metal equipment shed, and parking lot is also present in the West Block.
Ag (Row crop)	Agricultural (Row Crops)	The agricultural fields make up the majority of the land within the study area. In 2018, the agricultural fields were planted with row crops (corn and soybeans).

ELC Code	ELC Description	Environmental Characteristics
Ag (Sod)	Agriculture (Sod)	In addition to row crop agricultural fields, large areas of the study area are sod field. These areas are large open areas that are regularly mowed.
Orchard	Orchard	The orchard community contains Common Apple (*Malus pumila*) with interspersed vegetation species which have naturally succeeded. The abandoned orchard is overgrown with grasses, forbs and shrubs, and maintains a relatively dense ecosystem within lands directly adjacent to the Central Block subject site and within the western portion of the East 'A' Block.
Hedgerow	Deciduous Hedgerow HD) and Coniferous Hedgerow (HC)	Deciduous and coniferous hedgerow communities throughout the study area maintain a high abundance of native and non-native tree and shrub species which provide windbreaks between agricultural fields and natural corridors throughout the study area.
CUW1	Cultural Woodland	This anthropogenic woodland community is immediately adjacent to the western boundary of the West Block. Additional details on this vegetation community will be provided as part of the future revised EIS.
Deciduous Forest		
FOD5-6	Dry-Fresh Sugar Maple – Basswood Deciduous Forest Type	This deciduous forest community overlaps with the southeastern portion of the study area, south of the East 'B' Block. The canopy is dominated by American Basswood (*Tilia americana*), and Sugar Maple (*Acer saccharum*).
FOD8-1	Fresh-Moist Poplar Deciduous Forest Type	This deciduous forest community is dominated by poplar species (*Populus* spp.) and is present adjacent to the West Block. Additional details on this vegetation community will be provided as part of the future revised EIS.
Thicket		
CUT1-4	Gray Dogwood Deciduous Shrub Thicket Type	This pioneering thicket community overlaps with the study area south of the Central Block. Evidence of past agricultural use is present. **Canopy**: N/A **Sub-canopy**: Common Pear (*Pyrus communis*) **Understory**: Red-panicled (Gray) Dogwood (*Cornus racemosa*), Hawthorn species (*Crataegus sp*.). **Groundcover**: Daisy Fleabane (*Erigeron annuus*), Field Hawkweed (*Hieracium caespitosum*), Gray Goldenrod (*Solidago nemoralis*), New England Aster (*Symphyotrichum novae-angliae*), Arrow-leaved Aster (*Symphyotrichum urophyllum*).
Meadow		
CUM1	Mineral Cultural Meadow Ecosite	This meadow community comprises the majority of the West Block, in the former golf course lands. The golf course has not been in use for more than 3 years.

ELC Code	ELC Description	Environmental Characteristics
		Additional details on this vegetation community will be provided as part of the future revised EIS.
Wetland		
MAM2-2	Reed Canary Grass Mineral Meadow Marsh Type	This wetland community is a young-aged mineral meadow marsh associated with bottomland topography. Small areas are present in the Central and East 'A' Blocks, and adjacent to the East 'B' Block. **Canopy**: N/A **Sub-Canopy**: N/A **Understory**: Red-osier Dogwood, Wild Red Raspberry (*Rubus idaeus* ssp. *melanolasius*) **Groundcover**: Reed Canary Grass, Broad-leaved Cattail (*Typha latifolia*), Devil's Beggar-ticks (*Bidens frondosa*).
MAS2-1	Cattail Mineral Shallow Marsh Type	This wetland community is present in distinct sections along the reaches of HDF TTMC5. Additional details on this vegetation community will be provided as part of the future revised EIS.
SAF1	Floating-leaved Shallow Aquatic	A shallow pond with floating aquatic vegetation is present in the southeastern corner of the West Block. The pond is online with the reaches of HDF TTMC5. Additional details on this vegetation community will be provided as part of the future revised EIS.

4.3.2 Vascular Flora

During field surveys conducted in the Central and East Blocks between 2018 and 2019, 159 species of vascular plants were recorded in the study area. A list of these observed species is provided in Appendix V. A variety of both native and non-native species were observed. Areas including hedgerows, agricultural fields and a naturalizing orchard contained a high proportion of non-native forb and graminoid species. Invasive species in the hedgerows are generally found along edges, trails, and areas of disturbance. Garlic Mustard (*Alliaria petiolata*) and European Buckthorn (*Rhamnus cathartica*), 2 highly invasive species, were observed throughout the study area. Details on the vascular flora in the West Block will be provided as part of the future revised EIS.

In vicinity of the study area, 16 SAR or SCC plant species are reported (MNRF 2019b, MNBRF 2019c). A summary of these species, their current ranks, and preferred habitats are provided in the SAR and SCC screening table (Appendix II). Field surveys results confirmed the presence of 1 SAR tree in the Central and East Blocks: Butternut (*Juglans cinerea*). In addition, 1 SCC plant species, Honey-locust (*Gleditsia triacanthos*) was observed in the study area along with 2

regionally rare species: Black Spruce (*Picea mariana*) and Giant Solomon's Seal (*Polygonatum biflorum*).

4.3.3 Trees

In total, 1,278 trees were inventoried in Central and East Blocks in 2019, comprising 48 species. Of the trees inventoried and assessed, 1,081 (84.5%) are native species and 194 (15.2%) are non-native; an additional 3 trees could not be identified because of their advanced state of decay. Nearly one-third (28%) of all trees inventoried in 2019 were Black Walnut (*Juglans nigra*). More than half (55.1%) of inventoried trees were assessed as in fair health with an improbable or possible potential for structural failure. An additional 36 Eastern White Cedar (*Thuja occidentalis*) trees were reported from 2 hedgerows in the yard of the existing residential building in the northwesternmost corner of Central Block. Adjacent trees were inventoried in 2018 (see Section 3.1.2). Full details are provided in the TPP for the Central and East Blocks (Appendix IV). The TPP provided in Appendix IV will be revised to include tree inventory details from the West Block once field surveys are completed.

4.3.4 Wetlands

Several unevaluated wetland features are present in the study area and are associated with the riparian corridors of HDFs. Unevaluated wetlands are located intermittently along the TTMC5 HDF in the southern portion of the West and Central Block subject sites. Small areas of Cattail Mineral Shallow Marsh (MAS2-1) are present in the West Block. A Reed Canary Grass Mineral Meadow Marsh (MAM2-2) extends northeast from a Floating-leaved Shallow Aquatic (SAF1) pond feature at the eastern edge of the West Block, along the HDF through the naturalizing orchard in the study area and into the southwest corner of the East ‘A’ Block subject site. Other pockets of meadow marsh (MAM2-2) that occur within the study area are located where TTMC5 intersects with Twenty Road West along the north boundary of the East ‘B’ Block, and where TTMC3 originates south of the Central Block.

The study area contains a portion of the Upper Twenty Mile Creek PSW complex, east of the East ‘B’ Block. In this area, the PSW is a meadow marsh (MAM2-2) online with HDF TTMC3. A field evaluation of this feature has not been done as it was located on non-participating lands at the time field surveys were completed.

NRSI biologists delineated the wetland feature in the Central and East Blocks on July 30 and August 6, 2019. The boundaries of these features were field verified by the NPCA’s Ecologist (Lisa Price) and the City’s Natural Heritage Planner (Melissa Kiddie) on August 8, 2019. The

verified boundaries of the wetlands were then surveyed by NRSI biologists using a SXBlue II GNSS GPS unit. The ELC Map (Map 4) reflects the surveyed boundaries of these wetlands. As part of these delineations, the western edge of the PSW was also surveyed in the field during the 2019 site visits. The boundaries of the unevaluated wetlands in the West Block will be delineated and verified by agency staff in 2020.

4.4 Wildlife

4.4.1 Birds

Based on data from OBBA Square 17NH88 (BSC et al. 2006), 112 bird species are reported from the vicinity of the study area. The data includes species observed, reported to nest, and/or have exhibited evidence of breeding in the 10x10km square overlapping the study area. During breeding bird surveys and the single marsh bird survey conducted by NRSI biologists in 2018 and 2019, 40 of these species were observed in the study area. An additional 6 species were observed in the West Block outside of the breeding season in early 2020. A summary of the number of species observed in each subject site is provided in Table 4. Overall, 3 species were confirmed to be breeding in the study area: American Robin (*Turdus migratorius*), Cedar Waxwing (*Bombycilla cedrorum*), and Killdeer (*Charadrius vociferus*). A number of additional species exhibited probable evidence of breeding (Table 4). Targeted surveys for birds have not yet been completed for the West Block; however, those bird species observed by NRSI biologists during other site visits prior to May 31, 2020 are included in Appendix VI and summarized in Table 4.

Table 4. Summary of Bird Species Observed (2018-2019)

Subject Site	Breeding Evidence			
	Possible	Probable	Confirmed	Observed (no evidence of breeding)
East 'A' Block	6	6	0	3
East 'B' Block	8	5	2	2
Central Block	12	9	1	2
West Block	n/a			32

Background information reports 32 SAR or SCC bird species from the vicinity of the study area (BSC et al. 2006, MNRF 2018, MNRF 2019c). A summary of these species, their current ranks, and preferred habitats are provided in the SAR and SCC screening exercise (Appendix II). NRSI biologists observed 3 of these bird SAR and 1 bird SCC in the study area: Barn Swallow (*Hirundo rustica*), Chimney Swift (*Chaetura pelagica*), Eastern Meadowlark (*Sturnella magna*),

and Eastern Wood-Pewee (*Contopus virens*). A complete list of bird species observed in the study area and their associated breeding evidence codes is provided in Appendix VI.

Barn Swallow is listed as Threatened both federally and provincially and is afforded protection under the ESA. This species typically uses open habitats for foraging, including grassy fields, meadows, pastures, and open bodies of water. Barn Swallows generally nest in artificial structures including barns, outbuildings, houses, and bridges. In 2018, Barn Swallow individuals were observed entering and exiting the abandoned residence in the East 'B' Block subject site. This indicates that Barn Swallow is likely breeding in that location. Health and safety considerations prevented NRSI biologists from entering the abandoned residence to confirm the presence of nest cups or other breeding evidence. Barn Swallows were observed foraging with no evidence of breeding in the Central Block subject site. In the early spring of 2020, a Barn Swallow nest cup was observed at the abandoned golf course clubhouse in the West Block; adults carrying nest material were observed in late May, and Barn Swallow breeding is considered Probable in the West Block. Additional surveys in 2020 will determine if this species is confirmed as breeding at the clubhouse location. In general, suitable habitat for breeding is present in the study area at multiple locations including abandoned residential buildings and standing/dilapidated barns. Foraging habitat is plentiful over the agricultural lands on site.

Chimney Swift is a SAR in Ontario that is listed as Threated both federally and provincially. Chimney Swift often nests in chimneys although it will nest in suitable trees and in rock cliffs and crevices. This species is highly gregarious and often forages in groups over open water. During a field visit in August 2019, NRSI biologists observed 6 individuals flying high over the eastern hedgerow (H) of the Central Block subject site. No breeding evidence was recorded during breeding bird surveys in 2018. Chimney Swift nest predominantly in urban areas where there are chimneys and other suitable anthropogenic features present. The old farmhouses within the study area may have uncapped chimneys suitable for nesting Chimney Swift, however given the absence of observations during breeding bird surveys, the time of year, and behaviour of the individuals that were noted in August 2019, the recorded swifts were likely a migrating or a foraging family group passing through the study area. No other observations of Chimney Swift were made by NRSI staff during field surveys prior to May 31, 2020.

Eastern Meadowlark is listed as Threatened both federally and provincially and is afforded protection under the ESA. Eastern Meadowlark often uses a variety of grassland habitat

including pasture and agricultural hayfield for nesting. Suitable habitat is generally absent from the study area as agricultural row crop and sod are not the preferred habitat. Habitat for this species may be present in the West Block within the Mineral Cultural Meadow (CUM1) community; however, the meadow was tilled in early spring of 2020 which rendered the habitat marginal on account of the disturbance and stunted re-growth of the naturalized vegetation A single singing male was observed in the naturalized orchard in the East 'A' Block by NRSI biologists outside the breeding period during a site visit in April, 2018. NRSI biologists did not observe breeding evidence during breeding bird surveys conducted in 2018. The observed individual was likely travelling through the study area during migration.

Eastern Wood-Pewee is a SCC in Ontario and is listed as Special Concern both federally and provincially. Eastern Wood-Pewee is found throughout Southern Ontario, and typically breeds in deciduous woodlands, and occasionally in more open habitats. They are most abundant in forest stands of intermediate age and mature stands with little understory vegetation (COSEWIC 2012). During migration, a variety of habitats may be used by Eastern Wood-Pewee including early successional clearings, forest edges, as well as interior forest. During breeding bird surveys in 2018, Eastern Wood-Pewee was recorded outside of the subject sites, and in the study area to the southeast of the Central Block subject site. Possible breeding evidence was observed, with a single male singing at breeding bird monitoring station BMB-004. No other observations of this species were made during breeding bird surveys in the study area. Eastern Wood-Pewee was also heard calling from the woodland southwest of the West Block in early spring 2020. Breeding bird surveys in 2020 will determine if this species is breeding in or near the West Block.

Of the species observed on the subject sites, 7 are considered regionally uncommon and 1 is considered regionally rare (HCA 2014). During breeding bird surveys in 2018, and field visits between 2018 and 2020, NRSI biologists observed 8 regionally significant species with varying breeding evidence:

a) Regionally Uncommon
    - American Redstart (*Setophaga ruticilla*) – evidence of possible breeding;
    - Belted Kingfisher (*Megaceryle alcyon*) – no breeding evidence;
    - Chimney Swift – no breeding evidence;
    - Eastern Meadowlark – no breeding evidence;
    - Great Blue Heron (*Ardea Herodias*) – no breeding evidence;

- Red-bellied Woodpecker (*Melanerpes carolinus*) – evidence of possible breeding;
- Turkey Vulture (*Cathartes aura*) – no breeding evidence; and

b) Regionally Rare

- Sandhill Crane (*Antigone canadensis*) – no breeding evidence.

4.4.2 Herpetofauna

According to the Ontario Reptile and Amphibian Atlas (Ontario Nature 2019), 26 herpetofauna species are reported from 10x10 km square that overlaps the study area. Field surveys conducted by NRSI biologists between 2018 and 2020 confirmed the presence of 10 species in the subject sites. Targeted anuran call, turtle emergence and basking, and snake cover board surveys were conducted by NRSI biologists to identify all taxa where suitable habitat was present.

In the vicinity of the study area, 12 SAR or SCC amphibian and reptile species are reported to occur (MNRF 2018, MNRF 2019c, Ontario Nature 2019). A summary of these species, their current ranks, and preferred habitats are provided in the SAR and SCC screening table (Appendix II). A single herpetofauna SCC, Snapping Turtle (*Chelydra serpentina*), was observed during targeted surveys by NRSI biologists in the study area. A complete list of herpetofauna species observed in the study area is provided in Appendix VII. The results of taxa-specific surveys are detailed in the following sections.

Anuran Call Surveys

Anuran call surveys were conducted to identify the presence of breeding frog and toad species in suitable habitat in the study area (Map 2). During anuran call surveys in 2018, 3 anuran species were recorded in the study area encompassing the Central and East Blocks: Spring Peeper (*Pseudacris crucifer*), Green Frog (*Lithobates clamitans*) and Gray Treefrog (*Hyla versicolor*). During the first 2 anuran call surveys at features in the West Block, these same 3 species were observed calling in addition to Northern Leopard Frog (*Lithobates pipiens*) and American Toad (*Anaxyrus americanus*). Table 5 provides a summary of call codes and the estimated abundance of each species during surveys.

Table 5. Anuran Call Survey Results

Survey Date	UBE Block	Survey Station	Anuran Species and Abundance*				
			Spring Peeper	Green Frog	Gray Tree Frog	American Toad	Northern Leopard Frog
2018 Surveys							
April 24, 2019 (10.5°C)	Central	ANR-001	1(5)	-	-	-	-
		ANR-002	*no calling anurans present*				
		ANR-003	3	-	-	-	-
	East 'B'	ANR-005	1(4)	-	-	-	-
		ANR-006	*no calling anurans present*				
		ANR-007	*no calling anurans present*				
May 28, 2019 (23°C)	Central	ANR-001	-	1(6)	-	-	-
		ANR-002	*no calling anurans present*				
		ANR-003	*no calling anurans present*				
	East 'B'	ANR-005	-	-	1(1)	-	-
		ANR-006	1(1)	-	1(1)	-	-
		ANR-007	*no calling anurans present*				
June 20, 2019 (19.5°C)	Central	ANR-001	-	1(4)	-		
		ANR-002	*no calling anurans present*				
		ANR-003	*no calling anurans present*				
	East 'B'	ANR-005	*no calling anurans present*				
		ANR-006	*no calling anurans present*				
		ANR-007	*no calling anurans present*				
2020 Surveys							
April 27, 2020 (8°C)	West	ANR-001	*no calling anurans present*				
		ANR-002	3	-	-	1(3)	1(1)
		ANR-003	1(1)	-	-	1(1)	1(1)
May 26, 2020 (21°C)		ANR-001	2(2)	-	2(4)	-	-
		ANR-002					
		ANR-003	2(3)	1(5)	-	-	-

*Abundance refers to the Marsh Monitoring Programs call codes (Bird Studies Canada 2009b). Call codes are as follows: 1 – individuals heard and calls not overlapping, 2- individuals heard and calls overlapping, 3- full chorus, numbers cannot be estimated. The numbers in brackets are the estimated number of individuals.

Turtle Emergence and Basking Surveys

In the spring of 2020, NRSI biologists completed 1 emergence survey followed by 5 basking surveys targeting the Floating-leaved Shallow Aquatic (SAF1) pond in the West Block (Map 4). Surveys were completed between April 6 and May 25, 2020. NRSI biologists documented up to 5 Midland Painted Turtles (*Chrysemys picta marginata*) and 1 Snapping Turtle on each survey. Each species was observed during 5 out of 6 surveys.

Turtle Nesting Surveys

In 2019, NRSI biologists conducted an assessment of turtle nesting habitat within approximately 100m of the large pond located just outside of the study area, south of the Central Block. The 100m search area overlapped with the UBE study area, and so the results of the assessment

are included in this report. Suitable nesting habitat was not present in the study area. Turtles prefer sites with relatively soft, dry substrates (e.g. sand or fine gravel), that are open and sunny, close to water, away from roads, and where the risk of predation is low (OMNR 2000). The areas surrounding the pond is densely vegetated with low lying areas with damp soils, and no turtle nesting habitat was observed.

Open areas nearby to the pond in the southeast corner of the West Block are present, including several old golf course sand pits. Turtle nesting habitat assessments and targeted nest surveys are scheduled in 2020 for the West Block but did not take place before the May 31, 2020 cut-off date for this EIS.

Snake Cover Board Surveys

A detailed field program for snake cover board surveys was established in 2018 to record snake species present in the study area. Of the 6 snake species recorded within 10 km of the study area (Ontario Nature 2019), 3 species were observed by NRSI biologists: Dekay's Brownsnake (*Storeria dekayi*), Northern Red-bellied Snake (*Storeria occipitomaculata*), and Eastern Gartersnake (*Thamnophis sirtalis sirtalis*). No SCC or SAR snakes were observed; however, the Northern Red-bellied Snake is noted as regionally rare and Dekay's Brownsnake is uncommon in the Hamilton Region (HCA 2014).

4.4.3 Mammals

According to the Mammal Atlas of Ontario (Dobbyn 1994), 32 mammal species are reported near the study area. NRSI biologists conducted targeted mammal surveys including a winter wildlife survey in all UBE Blocks, and bat habitat assessments in the Central and East Blocks. Bat habitat assessments in the West Block are scheduled for 2020. Surveys recorded observations of 7 mammal species in the study area, including signs (e.g. tracks, scat, dens) and direct observation.

Background information reports 7 SAR or SCC mammal species from the vicinity of the study area (Dobbyn 1994, MNRF 2018, MNRF 2019c). A summary of these species, their current ranks, and preferred habitats are provided in the SAR and SCC screening exercise (Appendix II). No mammal regulated SAR or SCC were observed; however, suitable habitat for SAR bats, including Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), and Tri-colored Bat, is present throughout the study area. Habitat for SAR bats is further discussed in the Habitat of Endangered and Threatened Species section below. A complete list of mammal species reported from and observed in the study area is provided in Appendix VIII.

The tenant of the rural farm residence adjacent to the east boundary of the Central Block subject site indicated that Coyote (*Canis latrans*) and White-tailed Deer (*Odocoileus virginianus*) are particularly active in the study area. The landowner described observations of Coyote denning on a yearly basis in or near a dilapidated shed to the south of his residence, directly adjacent to the naturalized orchard. Coyote has also been reported by another tenant as regularly denning near the abandoned residence in the southwest corner of the Central Block. The tenant also described observing groups of up to 15 White-tailed Deer at a time in the general study area. During the 2018 and 2020 winter wildlife surveys, a high concentration of Coyote tracks was observed throughout the orchard that indicated regular Coyote movement between the agricultural field in the east and the orchard. Wildlife signs in the West Block were scarce during 2020 winter wildlife surveys, consistent with the limited amount of cover available in that area.

4.4.4 Insects

Butterflies

According to the Ontario Butterfly Atlas (Macnaughton et al. 2019), 71 butterfly species are reported from the study area. NRSI biologists observed a total of 21 species during field surveys in the Central and East Blocks in 2019. A complete list of butterfly species observed in the subject site in 2019 is provided in Appendix IX.

One butterfly SCC, Monarch (*Danaus plexippus*), was observed in the study area. Monarch is listed as Special Concern provincially and has been uplisted to Endangered federally. Adult Monarchs are found in a diverse array habitats and feed on nectar from wildflowers; their caterpillars are restricted to meadow and open habitats with abundant Milkweed (*Asclepias* spp.), their food plant (COSEWIC 2016). A number of adult Monarch were observed during field surveys, with a maximum of 11 individuals documented during a single survey on July 16, 2019. A single Monarch caterpillar was also observed within the naturalizing orchard in the study area. During vegetation surveys, Common Milkweed (*Asclepias syriaca*) was observed occasionally throughout both the orchard and hedgerow vegetation communities, and the observation of a Monarch caterpillar indicates that this species is breeding within the study area. However, the overall abundance of milkweed is low, and not considered adequate to support a significant breeding population of this species. The adult individuals observed during field surveys were most likely foraging.

Odonata

According to the Ontario Odonata Atlas (OOAD), 4 odonata (dragonfly and damselfly) species are reported to occur in the vicinity of the study area. During targeted field surveys, NRSI biologists observed 10 species; no odonata SAR or SCC were observed. A complete list of odonata species observed in the study area in 2018, and 2019 is provided in Appendix X.

Insect surveys in the West Block are scheduled for 2020. Results will be presented as part of a future revised EIS.

4.4.5 Fish

According to DFO species at risk mapping (DFO 2019), a single fish SCC, Grass Pickerel, is reported from the Upper Twenty Mile Creek Watershed. Grass Pickerel is designated as Special Concern provincially and federally. Based on the background review, DFO SAR mapping indicated that some of the HDFs in the study area may provide habitat for Grass Pickerel. Grass Pickerel habitat includes wetlands, ponds, slow-moving streams, and shallow bays of larger lakes with warm, shallow, clear water, and an abundance of aquatic plants (MECP 2019). This species can be present from the mouth of a river to its headwaters; however, it avoids fast moving water, riffle areas, and areas with high turbidity. It prefers gentle slopes with low velocities and rarely migrates long distances seasonally. Riparian vegetation and channel cover are highly important for this species (Coker et al. 2010). Grass Pickerel spawn in the spring, from March to May in lakes and rivers at temperatures between 4°C and 12°C (Eakins 2019). Spawning habitat is characterized by heavily vegetated areas, such as flooded pond banks, stream margins, and floodplains (Coker et al. 2010), flooded riparian areas and wetlands. This species prefers low banks that provide good access to vegetated flood fringes. Nursery habitat is in lakes and rivers in flooded riparian areas that stay wet for long periods (e.g. wetlands on clay soils). Further information on fish habitat in the study area is provided in the Aquatic Habitat section.

4.5 Significant Wildlife Habitat

The SWHTG outlines habitat types that the MNRF considers significant in Ontario, and criteria to identify and evaluate these habitats (OMNR 2000 and MNRF 2015a). As a first step to evaluating potential SWH in the subject sites and study area, NRSI completed a background review and desktop assessment. This assessment used general evaluation criteria set out in the SWHTG, Ecoregion 7E Criteria Schedule (MNRF 2015a), to identify the presence of candidate SWH. The desktop assessment guided the scope of field surveys and location of

monitoring stations so that relevant data to support the SWH analysis was collected. Once all field data was collected each SWH identified in the desktop assessment was re-evaluated and identified as confirmed, candidate, or not SWH.

Following field studies, 3 candidate SWH types were identified in the study area: Marsh Breeding Bird Habitat, Reptile Hibernaculum, and Habitat for Special Concern and Rare Wildlife Species. In addition, Turtle Overwintering SWH was confirmed in the West Block following spring 2020 field surveys. Refer to the final SWH screening table (Appendix III) for a detailed assessment and rationale of each SWH type assessed in the study area. Candidate and confirmed SWH types are discussed below.

4.5.1 Marsh Breeding Bird Habitat

Marsh bird breeding habitat may be found in marshes, shallow aquatic, fens, and bog communities. Marsh bird nesting occurs in wetlands and all wetland habitats are to be considered as long as there is shallow water with emergent aquatic vegetation (MNRF 2015a).

Candidate Marsh Breeding Bird SWH is present in the all UBE Blocks within identified wetland habitat. Breeding marsh bird species were not observed by NRSI biologists during breeding bird surveys or incidentally during various other field visits in 2018 or 2019. A single marsh breeding bird survey was conducted on June 7, 2019 in the Central Block subject site MAM2-2 wetland feature; no marsh bird species were recorded.

Additional field studies are scheduled for 2020 in all UBE Blocks to determine if Marsh Breeding Bird SWH is present.

4.5.2 Reptile Hibernaculum

Snakes hibernate below the frost line in Ontario and reptile hibernacula may be found in any ecosite other than very wet communities (MNRF 2015a). Hibernation can take place in burrows, rock crevices, rock piles, slopes, old stone fences, and abandoned crumbling foundations (MNRF 2015a).

Candidate Reptile Hibernaculum SWH is potentially present in the wetlands throughout the study area, and in areas with significant debris accumulations, old foundations, or capped wells near the abandoned dwellings, outbuildings, and golf course clubhouse. No significant congregations of snake species have been observed by NRSI biologists during targeted cover board surveys in 2018 or 2019. Nonetheless, additional field studies are scheduled for 2020 in all UBE Blocks to determine if Reptile Hibernaculum SWH is present.

4.5.3 Special Concern and Rare Wildlife Species

Candidate habitat for Grass Pickerel may be present off site, along HDF reach TTMC3-2 in the study area containing the Upper Twenty Mile Creek PSW Complex. Aquatic habitat field surveys were conducted in spring and summer 2019 and confirmed that suitable spawning and nursery habitat for this species is present in TTMC3-2. All HDFs in the study area were assessed by NRSI aquatic biologists and no other suitable habitat for Grass Pickerel was observed in the study area. Potential breeding habitat for Eastern Wood-Pewee may also be present in woodland habitats within or adjacent to the UBE subject sites.

4.5.4 Turtle Overwintering Habitat

Turtles overwinter where permanent water is present at a depth sufficient to resist freezing through. Wetlands, ponds, lakes, and rivers with adequate dissolved oxygen and soft, muddy substrates where turtles can burrow are considered candidate Turtle Overwintering Habitat SWH. The Floating-leaved Shallow Aquatic (SAF1) pond in the West Block was identified as potentially suitable for turtle overwintering, and NRSI biologists conducted comprehensive emergence and basking surveys in early spring 2020 to determine if this SWH type is present.

The criteria for confirming Turtle Overwintering SWH is the use of a feature by 5 or more Midland Painted Turtles, or a single Snapping Turtle. Based on the observation of a Snapping Turtle during almost all emergence and basking surveys (this was likely the same individual each time), the pond meets the criteria for SWH.

4.6 Habitat of Endangered and Threatened Species

Based on the results of wildlife-specific field surveys conducted between 2018 and 2020 detailed in the Existing Conditions section, habitat for SAR is present in the study area for Butternut, Barn Swallow and SAR bats. These species and their general habitats are protected under Sections 9(1) and 10(1) of the ESA and are discussed further below. Final results of the SAR and SCC desktop assessment, based on original field surveys and habitats present, are provided in Appendix II.

4.6.1 Butternut Trees

Butternut is designated as Endangered provincially by COSSARO and federally by COSEWIC. As a result, this species and its general habitat are protected under the ESA. Protected habitat for Butternut includes a 50m radius from any individual. This may be amended through a butternut health assessment, which would be required for each individual that may be impacted

by any development, including any impacts to protected habitat of any individual tree. Butternut's preferred habitat consists of stream banks and swamps, as well as upland beech-maple, oak-hickory, and mixed hardwood stands (Reznicek et al. 2011).

Under the ESA (2007) and Section 23.7 of Ontario Regulation (O.Reg.) 242/08, it is an offence to kill, harm, or take a Butternut tree that is not exempt from protection. Butternut specimens that may be exempt from protection under the ESA include genetic hybrids, cultivated individuals that were not planted as a condition of a permit under the ESA, and specimens severely impacted by the Butternut canker (*Ophiognomonia clavigignenti-juglandacearum*). A Butternut Health Assessor (BHA) qualified by the MECP must conduct an assessment of a Butternut to determine its Category that reflects the tree's condition and proximity to others infected with Butternut canker. As a result of such an assessment, a Butternut will be classified as one of: Category 1, "non-retainable"; Category 2, "retainable"; or Category 3, "archivable".

More than 150 Butternuts have been identified to date across the wider UWS lands; only some of these are within the present subject sites (Appendix IV). Across the subject sites, 9 Butternuts have had health assessments completed and an additional 5 remain to be assessed. A Butternut Health Assessor's Report has not yet been submitted to the MECP, however engagement with the agency on the approach and next steps for SAR, including Butternut, in the overall UWS lands has been initiated (Appendix IV).

4.6.2 Barn Swallow

Barn Swallow is designated as Threatened provincially by COSSARO and federally by COSEWIC. As a result, this species and its general habitat are protected under the ESA. Probable Barn Swallow breeding evidence was recorded in the West and East 'B' Blocks. During targeted breeding bird surveys conducted in 2018, Barn Swallow individuals were observed entering and exiting the abandoned residence in the East 'B' Block subject site. This indicates that Barn Swallow is likely breeding in that location. Health and safety considerations prevented NRSI biologists from entering the abandoned residence to confirm the presence of nest cups or other breeding evidence. In the early spring of 2020, a Barn Swallow nest cup was observed at the abandoned golf course clubhouse in the West Block; adults carrying nest material were observed in late May, and Barn Swallow breeding is considered Probable in the West Block. Barn Swallows were also regularly observed across the entire study area both during targeted bird surveys and other site visits. Suitable foraging habitat for Barn Swallow comprises a wide range of natural and anthropogenic open habitats, including grazed pastures,

row crop fields, open water and riparian areas, road rights-of-way, and rural residential properties (Heagy et al. 2014). The MNRF definition of Barn Swallow habitat includes suitable foraging habitat within 200m of the nest site (MNRF undated). The areas of the subject sites that fall within 200m of the abandoned residence and club house are considered suitable foraging habitat.

4.6.3 Species at Risk Bats

Results of the SAR and SCC Screening (Appendix II) indicate that 3 SAR bats may have candidate habitat within the study area. These species include Little Brown Myotis, Northern Myotis, and Tri-colored Bat, all of which are listed as Endangered provincially and are afforded general habitat protection under the ESA (2007). Little Brown Myotis and Northern Myotis typically roost in tree cavities, hollows, under loose bark, and in buildings (OMNR 2000; MNRF 2017). Tri-colored Bat roosts in clusters of live or dead tree foliage in or below the canopy; oak species are often preferred to other tree species, although maple species are also used.

Results of bat habitat assessments conducted during leaf-on and leaf-off conditions indicated that a number of candidate roosting trees are present throughout the Central, East 'A', and East 'B' Blocks that could provide habitat for SAR bats. As discussed later in this report, additional studies targeting SAR bats may be required and should be determined through consultation with the MECP. These studies are to include the investigation and assessment of all structures on site for their potential to provide bat habitat well in advance of all proposed demolition activities.

5.0 Headwater Drainage Features and Aquatic Habitat

The study area is in the headwaters of the Twenty Mile Creek Watershed. Several headwater tributaries of Twenty Mile Creek are located in the study area, flowing west to join the main stem of Twenty Mile Creek. All HDF reaches and aquatic habitats assessed in the study area are shown on Map 3. The HDF reaches in the Central and East Blocks were assessed over 3 site visits in 2019, which is in accordance with the Headwater Guideline (TRCA and CVC 2014). All of the reaches were simultaneously assessed for aquatic habitat. HDF assessments for the reaches in the West Block are scheduled for 2020; while the 1st 2 visits were completed by May 31, 2020, reach characterizations and appropriate management recommendations will be provided as part of the future revised EIS.

All Central and East Block HDF reaches are discussed below. The aquatic habitat discussion is restricted to those reaches in the above-noted blocks that contain potential aquatic habitat. Where aquatic habitat is not discussed for a specific reach, NRSI biologists determined that only highly limited indirect fish habitat, or no habitat at all was present. This determination was made based on feature form, presence of debris and fish barriers, riparian conditions, and downstream conditions (e.g. the feature is piped though a subdivision or otherwise diverted to stormwater ponds). Grass Pickerel (a provincial and federal SCC) is reported from the Upper Twenty Mile Creek Watershed. The aquatic habitat assessments noted all potential habitat for fish, with specific attention to suitable Grass Pickerel habitat. The HDFs in the subject sites do not provide suitable habitat for Grass Pickerel due to an overall lack of riparian vegetation, sections of steep slopes, and other fish movement barriers. The following section has been prepared in cooperation with GEO Morphix Limited, the fluvial geomorphology consultant on the project team. The geomorphic reach descriptions were provided by GEO Morphix and NRSI prepared the aquatic habitat discussion.

5.1 Branch TTMC-3

Headwater tributary TTMC 3 extends through the central portion of the UWS, south of the East A and East B Blocks, in a northeast direction. The feature continues east through the PSW and joins the main channel of Twenty Mile Creek. The HDF flows through a meadow marsh wetland before emptying into an online pond under an informal pedestrian crossing. The HDF continues downstream through agricultural fields until it reaches the PSW. Overall, the HDF is degraded due to active agriculture extending up to and through the channel, and anthropogenic influences in the orchard and the online pond. Aquatic habitat was assessed for all reaches of TTMC 3.

The lower reaches of this HDF (TTMC 3-3, TTMC 3-4) provide supporting/indirect habitat to downstream reaches through the supply of allochthonous and sediment.

TTMC3-2

Reach TTMC3-2 is a 610m long feature that conveyed flows eastward in the northeast corner of the UWS and beyond. The feature occupies a wide grassy corridor mapped as a PSW. The feature was wet during all site visits, and had substrate that consisted of clay, silt and organic materials. The reach had no discernible banks and, given its wide corridor, measurements of the feature width were conducted using GIS, which determined the feature is approximately 35m wide. It is characterized by diffuse flow through dense grasses and patches of cattail species. This section provides direct fish habitat when water is present and levels are high enough to support fish (confirmed in the spring of 2020). No other aquatic habitat characteristics are present in this reach. Grass Pickerel may use this reach for spawning if the area stays flooded long enough for the eggs to hatch. Fish barriers may be present downstream in reaches that could that not be accessed.

TTMC3-2-1

Reach TTMC3-2-1 is a 383m long intermittent channel that conveyed flows eastward through a Significant Woodland, and into a portion of the Upper Twenty Mile Creek PSW complex, near the eastern limit of the East B Block. Riparian vegetation included mature deciduous trees, some shrubs, and hydrophytic herbaceous vegetation. This hydrophytic vegetation (meadow marsh community) was commonly found in the feature. No geomorphic units were observed, and the substrate composition was predominately clay, silt and organic material. Water was present in the channel during the first 2 visits. The average feature width was 1.1m, and the average bankfull depth was 0.5m. The average wetted width and depth, as measured during the first visit, were 0.5m and 0.05m, respectively. This reach had defined banks; however, it became defuse in the downstream end before entering reach TTMC 3-2. Seasonal aquatic habitat may be present during the spring and early summer due to sufficient water levels and the presence of shade and cover that is provided by the Significant Woodland. Terrestrial crayfish chimneys were observed throughout this reach during the August site visit. This reach supports fish habitat downstream in the spring and early summer by supplying allocthonous and sediment to reach TTMC 3-2 and the main branch of Twenty Mile Creek. Dense vegetation (grasses) present at the downstream extent provides potentially suitable spawning habitat for Grass Pickerel.

TTMC3-2-2

Reach TTMC3-2-2 is a 170m long intermittent channel that conveyed flows eastward from an agricultural field to the Significant Woodland at the northeast corner of the study area. Riparian vegetation adjacent to the feature consisted of agricultural crops that encroached into the channel. Substrate consisted predominately of clay, silt and gravel. Water was present in the channel during the first 2 visits. By August 15, 2019 the channel was mostly dry; however, water was found at the upstream extent of the reach, which was draining into the feature from a tile drain. The water quickly disappeared into a small hole in the ground in the agricultural field. The feature becomes defuse as it enters reach TTMC 3-2-1 in the Significant Woodland. The average bankfull width of this feature was 1.33m, with a corresponding bankfull depth of 0.27m. During the first site visit, the wetted width of the feature was 0.57m, with an average wetted depth of 0.05m. Reach TTMC 3-2-2 provides minimal fish habitat due to its lack of riparian vegetation and the diffuse nature of flow; however, it supports fish habitat downstream throughout the year by supplying allocthonous and sediment to reach TTMC 3-2 and the main branch of Twenty Mile Creek.

TTMC3-3

Reach TTMC3-3 is a 223m long feature that conveyed flows eastward through an agricultural field at the southern extent of the East B Block. Water was only observed in the feature during the first assessment. The riparian buffer consisted of an agricultural field that was left fallow in 2019, while the feature itself was populated by herbaceous vegetation and grasses. Some evidence of sediment transport and deposition was observed in the feature, including sheet erosion and rilling in the floodplain. The channel had an average bankfull width of 3m, and an average bankfull depth of 0.15m. In the Spring, the average wetted width was 4.5m and the average wetted depth was 0.08m.

TTMC3-4

Reach TTMC3-4 is a short, 114m reach that conveyed flows eastward between 2 agricultural fields along the southern border of an abandoned residential property. The riparian buffer consisted of herbaceous species to the north and agricultural crops to the south. The channel bed was predominantly composed of clay and gravel, which was overlaid by a thin layer of silt and sand deposited during the freshet. The feature appears to have been historically channelized, which was evidenced by the high entrenchment relative to adjacent reaches and

the straight planform. The feature has an average bankfull with of 2.5m, and an average bankfull depth of 0.2m. During the first visit, the average wetted width of the feature was 1.27m and the average wetted depth was 0.09m.

TTMC3-5

Reach TTMC3-5 is a 316m long intermittent channel that conveyed flows eastwards through an agricultural field in the southwest corner of the East B Block area. This reach extends from the hedgerow south of the southeast corner of the East A Block to the southern corner of the residential dwelling in the East B Block. The upstream extent of the riparian corridor consisted of hydrophytic vegetation (Water Plantain (*Alisma plantago-aquatica*) and Cattail species (*Typha* spp.)), with the remaining riparian corridor dominated by agricultural crops. The dominant substrate was clay and silt, but some sand, gravel and, cobbles were also observed. During the first visit substantial flow was present due to the spring freshet. A knickpoint occurs immediately downstream of the hedgerow that separates the two agricultural fields and forms the transition between TTMC 3-5 to TTMC3-6. The knickpoint is approximately 0.5m and is a topographic divide between the elevated field to the west and the lower field to the east. While water was observed during the summer visit it was found only in isolated pools. The feature had an average bankfull width of 2.15m, and an average bankfull depth of 0.2m. During the first visit, the average wetted width was 0.9m and its average wetted depth was 0.04m. TTMC 3-5 provides indirect fish habitat and supports downstream reaches by transporting allochthonous and sediment. Fish were observed stranded in a small pool in the upstream extent of the reach on August 15, 2019; just below the knickpoint, where a tile drain discharged into the feature. Numerous (approximately 60) small Cyprinid species and a Bluegill (*Lepomis macrochirus*) were observed in the pooled water. The fish may have been transported downstream from the central pond during a heavy rain event; however, the origin of the fish cannot be confirmed until a fish community assessment is done in the pond. Since the knickpoint is a substantial barrier for fish movement upstream, it is unlikely that fish reached this point by travelling upstream from the main branch of Twenty Mile Creek. This reach does not provide Grass Pickerel Habitat.

TTMC3-6

Reach TTMC3-6 is 280m long intermittent channel that conveyed flows eastward through an agricultural field at the southern extent of the East A Block study area. Riparian vegetation, when present, consisted of grasses and herbaceous species; however, the channel was surrounded predominantly by agricultural crops. The agricultural field was left fallow in 2019

and was sprayed with herbicide prior to the August site visit. The bed and banks were mostly composed of the same material as the agricultural fields; a clay, silt, sand mixture, although some cobbles were present. Water was observed in the feature during all 3 visits. During visits 2 and 3 water was only found in isolated stagnant pools that were discontinuous. The average feature width of the reach was 2.8m. During the spring its average wetted width was 1.53m and its average wetted depth was 0.1m.

TTMC3-7

Reach TTMC3-7 is a short 79m vegetated swale that conveyed flows eastwards from the orchard though a small meadow to the agricultural field in the east. The bed composition observed was clay, silt and sparse gravel. Water was present only during the first visit in the spring following the freshet. The average width of this feature, which had no defined banks, was 4.37m. During the spring the average wetted width was 2m and the average wetted depth was 0.09m. Aquatic habitat observed during field surveys was limited to the presence of emergent vegetation. Diffuse flow, observed during the spring, and fish barriers upstream and downstream limit aquatic habitat in this reach. TTMC 3-7 may support downstream reaches by transporting allochthonous and sediment to downstream aquatic habitat. This reach does not constitute suitable Grass Pickerel habitat due to the large open agricultural fields connecting this reach to the downstream PSW.

TTMC3-8

Reach TTMC3-8 is an ephemeral feature that conveyed flows eastward from the central pond, situated in a deciduous swamp, to the small meadow in the east. The low gradient feature is 48m long, with a poorly defined channel and a bed that consisted of clay, silt, sand and organic material. This material was equivalent to that found in the riparian buffer, which was populated by deciduous trees. The feature had an average width of 5.77m, and during the spring visit had an average wetted width of 3.7m and an average wetted depth of 0.03m. Limited aquatic habitat is present in this reach due to poor feature definition and diffuse flow, when water is present (i.e. spring). Vegetation in and along this reach consists of dense Reed Canary Grass (*Phalaris caneriensis*), Jewelweed (*Impatiens capensis*), Sensitive Fern (*Onoclea sensibilis*) and some Cattail species. This reach is shaded by the large trees that line both sides of this HDF. There was no visible connection to the pond observed. A buried pipe may exist through the berm that is surrounding the pond; however, no evidence of a pipe was found during field surveys. During a 2018 survey, a dead Brook Stickleback (*Culaea inconstans*) was observed in

this reach. The feature contains aquatic habitat and may also provide nutrients and allochthonous transport to the PSW downstream. This reach does not constitute suitable Grass Pickerel habitat due to the large open agricultural fields connecting this reach to the downstream PSW.

TTMC3-9

Reach TTMC3-9 is an approximately 3000m^2 online pond located in the orchard and just outside the study area between the Central and East A Blocks. The riparian vegetation predominantly consisted of mature deciduous trees that shaded the pond. This feature may provide permanent fish habitat; however, fish movement upstream and downstream from the pond is potentially restricted by 2 barriers. Upstream of the pond, a corrugated steel pipe (CSP) connects the pond to reach TTMC 3-10 under an informal crossing; this culvert is currently not perched. During the April visit, the pond was connected to the upstream reach but the upstream end of the pond was dry in August and no connection to the upstream reach was present. The spring connection may provide access to the upstream wetland for spawning.

Immediately downstream of the pond, no connection between the pond to TTMC 3-8 was observed. Since water was present and flowing in reach TTMC3-8 during the spring site visit, a buried culvert may exist under the berm that surrounds the pond that provides a connection. This berm indicates that this pond is man-made, or was anthropogenically altered. The pond is approximately 120m in length and the width ranges from 13m to 35m at the high-water level as recorded during the April survey. The maximum water depth was over 1.5m during the April visit, and estimated to be 1m during the August visit. The shoreline has a moderate to steep slope between 5° and >15° and the bank (berm) height was estimated between 0.5m and 1.75m. The pond shoreline is treed on the east, south, and west sides. The shoreline on the north side has deciduous shrubs (Staghorn Sumac (*Rhus typhina*)) and dense grasses. Several large Willows (*Salix spp.*) overhang the pond and provide approximately 30% canopy cover. Duck Weed (*Lemna* spp.) and floating algae were abundant during the August 15, 2019 survey. The western side of the pond had emergent Reed Canary Grass patches where the water levels were much shallower. Permanent fish habitat is present in this pond, with woody debris and deciduous trees along the banks that provide shade and cover for potential fish populations. The berm at the downstream end of the pond is a barrier to fish movement into and out of the pond.

TTMC3-10

Reach TTMC3-10 is a 194m long headwater feature that conveyed flows eastward through a meadow marsh and cultural meadow at the south end of the orchard and the southeast corner of the Central Block study area. The reach is best described as a swale that is populated by dense hydrophytic vegetation in the feature and the riparian corridor. Upstream of this reach, conditions suggest that the feature is likely tile drained through the agricultural field; however, no tile drain outlet was found during field surveys. No clearly defined channel was observed through this reach, and the substrate was clay, silt and sand. Although water was present within the feature during all three field assessments, flow was only observed in April. During June and August water was only found in isolated, stagnant pools. The average feature width was measured at 6.3m; no bankfull channel was present. The average wetted width of the feature was 3.32m, and the average wetted depth was 0.12m. At the downstream extent of this reach, a 0.45m diameter CSP culvert directs flow into an approximately 10m long channel, before emptying into the central online pond. Pools were present throughout the wetland in reach TTMC3-10, and dense Reed Canary Grass provided shade to the feature. The feature contains limited aquatic habitat due to the diffuse nature of flow; however, it does provide allochthonous to the central online pond downstream. The culvert connecting TTMC3-10 to the online pond downstream is not a fish barrier. During higher flow periods in spring, fish can access TTMC3-10 through the culvert and into the wetland to breed; however, flow conditions and dense vegetation may limit the ability for fish to effectively use this habitat. Due to fish barriers present downstream of the pond Grass Pickerel cannot access reach TTMC3-10.

5.2 Branch TTMC-5

This HDF originates in a cattail marsh at the western edge of the Glancaster Golf Club near Glancaster Road. The feature passes through the golf course, and through unmaintained online ponds prior to entering the southwest corner of the Central Block subject site. The feature extends northeast towards Twenty Road West and exits the study area near the northeast corner of the East B Block. From Twenty Road West, the feature continues into a series of stormwater ponds, through a subdivision, and into a portion of the Twenty Mile Creek PSW Complex. The majority of this HDF provides indirect habitat that supports downstream aquatic habitat. Barriers to fish movement upstream are likely present in the stormwater ponds and through the pipes and culverts that connect them. The upper reaches of this HDF (TTMC5-5, TTMC5-7, and TTMC5-8) provide supporting / indirect habitat to downstream reaches through the supply of allochthonous and sediment.

TTMC5-4

Reach TTMC5-4 is a 336m long intermittent swale that conveyed flows eastward in the at the northwest corner of the East B Block to a roadside ditch adjacent to Twenty Road West. The Tributary then flowed through a series of pipes and online ponds and into a PSW before joining the main branch of Twenty Mile Creek. In the study area, the swale occupied a relatively wide corridor composed of hydrophytic herbaceous vegetation and grasses, and agricultural row crop. Given the poor bank definition in the reach, the feature width was measured, as no bankfull features were present. The average feature width was 21.7m. Substrate in the feature was consistent with the agricultural fields that occupied the upstream riparian buffer, and was clay, silt and sand. Water was present during visit 1 and 2, but the feature was dry during visit 3. The feature discharged to a 0.75m culvert under Twenty Road West. During the spring visit, the channel had an average wetted width of 18 m and an average wetted depth of 0.09m. This reach may provide seasonal fish habitat as it is connected to several stormwater ponds downstream. Site access downstream of Twenty Road West was not available so a full evaluation of fish barriers could not be completed. Since the stormwater ponds downstream of Twenty Road West are connected under residential streets, potential for fish barriers is present. During the June HDF site visit a Bluegill was observed in an isolated pool at the upstream extent of this reach. This fish may have come from the downstream stormwater ponds. Confirmation of the fish's origin will likely not be possible due to site access restrictions. This reach does not provide habitat for Grass Pickerel.

TTMC5-5

Reach TTMC5-5 is a 327m long intermittent swale that conveyed flows eastward through an agricultural field. The headwater feature lacked a naturally vegetated riparian corridor and was flanked by agricultural fields. It appeared that the feature was occasionally ploughed, and consequently substrate was generally consistent between the feature and adjacent fields, with the exception of occasional cobbles. Water was present during the first 2 visits, and an unknown minnow species was observed in the upstream portion of the reach during visit 2. Based on conditions observed during field surveys, it is assumed that this fish migrated upstream from the online ponds north of Twenty Road West. The feature width of the reach was 3.22m, and during the spring the average wetted width was 1.93 m and the average wetted depth was 0.13m.

TTMC5-6

Reach TTMC5-6 is a 452m long headwater feature that conveyed flows eastward in the central portion of the study area, between the Central and East A Blocks, and through the orchard. The reach is a wide grassy corridor composed of hydrophytic vegetation with an area of scattered deciduous trees, and is defined for a short stretch, within the treed area. Water was present during the first 2 site visits; the feature was dry during the summer. The substrate was predominantly clay, silt and sand, and the feature was full of dense rooted emergent aquatic vegetation. At the upstream extent of the reach, an offline agricultural pond was present, which contained water during the first 2 site visits, but not the third. The feature was approximately 29.3m wide, and during the spring had an average wetted width and depth of 20m and 0.11m, respectively. The feature split into multiple channels immediately upstream of the central laneway culvert and spread out, pooling in some places and flowing between debris piles, including car parts, tires, old culverts, and concrete slabs. Woody debris was scattered throughout the area, in the feature and along its edges. The feature entered a 0.5m CSP culvert underneath the central lane way in the abandoned orchard. Downstream of the laneway, the feature continued through a grassy swale. An unmaintained driveway to an abandoned farm crosses the downstream extent of the reach. The feature runs parallel to the driveway for approximately 20m before entering 2 CSP culverts, both measuring 0.57m in diameter, and discharging to a grassy swale.

Based on the presence of pools, backwater areas, woody debris, dense grassy vegetation, and trees, this reach has the potential to provide aquatic habitat. However, the presence of several culverts and debris piles restricts fish movement through the feature. Indirect habitat is present that supports downstream reaches through the transport of allochthonous and sediment. This headwater does not provide habitat for Grass Pickerel. Several fish barriers are present downstream (sections where the feature is piped, stormwater ponds, etc.) that may restrict access to TTMC5 in the study area.

TTMC5-7

Reach TTMC5-7 is a 188m long feature that conveyed flows eastward through the southern portion of the Central Block subject site. The reach is differentiated from Reach TTMC5-6 by its riparian buffer, which consisted of an agricultural field as opposed to an orchard and is otherwise a similar grassy corridor. Like the adjacent reach, the feature was intermittent, had substrate that consisted of clay, silt and sand. Emergent aquatic vegetation was sparse through

this reach, unlike TTMC5-6 that had dense emergent vegetation. The feature had an average width of 24m and had an equivalent wetted width during the first assessment.

TTMC5-8

Reach TTMC5-8 is 313m long intermittent swale that conveyed flows eastward through an agricultural field in the southwest portion of the Central Block. The feature had a narrow riparian corridor composed of herbaceous vegetation that was particularly evident towards the downstream extent of the reach. Water was observed during visit 1 and 2 and the reach was dry during visit 3, resulting in its classification as an intermittent channel. Substrate composition was predominantly clay, silt and sand with some scattered gravel. The average feature width was 2.98m, and during the spring, an average wetted width of 2.7m and an average wetted depth of 0.08m.

TTMC5-9-1

Reach TTMC5-9-1 is a short drainage feature with a moderate gradient that conveyed flows from a damaged 0.3m CSP at the upstream extent of the reach, which discharged flows from the abandoned golf course. The channel was wet during the first site visit, but dry during both subsequent visits and is therefore classified as an ephemeral feature. Although the feature had poorly defined banks, a discontinuous discernible channel was observed and had an average bankfull width of 0.51m and an average bankfull depth of 0.18m. During the spring, the average wetted width of the feature was 0.06 m and its average wetted depth was 0.02m

TTMC5-9

Reach TTMC5-9 is a short 120m long feature that originated at the outlet of a small pond in the abandoned Glancaster Golf and Country Club. The feature and conveyed flows eastward from the southwest corner of the Central Block to TTMC5-8. The feature was occupied by dense rooted emergent aquatic vegetation, particularly cattails, and was flanked by a deciduous forest to the north and an agricultural field to the south. The low gradient, intermittent feature contained substrate that was predominantly organic deposits, silt, and clay. The feature had an average width of approximately 20m, and during the spring had an average wetted width of 14.6m, and an average wetted depth of 0.06m.

5.3 Branch TTMC-6

This headwater tributary originates in the Central Block and flows eastward through agricultural fields and an abandoned orchard where it terminates at Twenty Road West north of the East A Block subject site. The entire tributary (HDF) does not provide direct fish habitat. Limited aquatic habitat is present in this reach during the spring, as the flow is generally diffuse. This reach provides a food source and allochthonous to downstream aquatic habitat.

TTMC6-1

Reach TTMC6-1 is 315m long poorly defined feature that conveyed flows eastward towards a roadside ditch on the south side of Twenty Road West. The reach extends from Twenty Road West through an agricultural field to the eastern edge of the orchard in the East A Block. Downstream of Twenty Road West the channel is piped or conveyed along the roadside ditch. The ultimate destination of this reach is unknown at this time, as no pipe inlets have been found to date. In the East A subject site, the feature was surrounded by agricultural crops and showed evidence of being frequently ploughed. Vegetation in the feature was predominantly composed of the same crops that occupied the adjacent fields, with sparse aquatic vegetation infrequently observed. Minimal flow was observed in the feature during the spring freshet. For the subsequent 2 visits the feature was dry, resulting in an ephemeral classification. Substrate in the feature was consistent with that of the adjacent fields, and was clay, silt, and sand. The average feature width was 2.8m, with the average wetted width during the first visit being 0.15m, and the average wetted depth being 0.02m.

TTMC6-2

Reach TTMC6-2 is a 177 m long feature with poor channel definition that conveyed flows eastward through the orchard on the east side of the East A subject site. The feature contained dense rooted emergent aquatic vegetation, particularly grasses, and was flanked by both meadow and scrubland in the riparian corridor. The substrate in the feature was predominantly clay, silt, and sand. The reach had an intermittent flow regime, although standing water was observed during the second visit and no water was observed during the third visit. The average feature width was 22.8 m, and the wetted width and depth observed during the spring visit was 5.5 m, and 0.23 m, respectively.

TTMC6-3

Reach TTMC6-3 is a 190 m long swale that conveyed flows eastward through an agricultural field between the Central and East A subject sites. The channel was located adjacent to an agricultural field that was left fallow in 2019, and had a narrow herbaceous riparian buffer. Substrate within the feature was clay, silt, and sand. No discernible channel could be located, particularly at the upstream extent of the reach, and it appeared that the upstream connection was somewhat limited. Where the ephemeral feature was discernible, the average width was 5.7m, and during the first visit the average wetted width was also 5.7 m and the average wetted depth was 0.04 m.

TTMC6-4

Reach TTMC6-4 is a short feature that occupied a wide section of the hedgerow between two agricultural fields at the eastern extent of the Central Block subject site. A clearly defined channel was not present through the hedgerow, although a vernal pool was noted during the first 2 visits that received drainage from the field to the west. The feature was surrounded by scrubland and deciduous trees, and substrate in the pool was dominated by decomposing organics. The feature is considered intermittent since water was present during the first and second visits, and no water was observed in the summer. The maximum average width of the pool was 21.7 m, and in the spring the average wetted width was 16.67 m with an average wetted depth of 0.16 m.

5.4 Branch TTMC-7

The tributary originates in the northeastern corner of the Central Block and flows eastward through a residential property and terminates at Twenty Road West. The downstream end, closer to Twenty Road West, is a grassed swale through the hydro corridor. Similar to TTMC-6, this entire HDF does not provide direct fish habitat. This reach may provide a food source and allochthonous to downstream aquatic habitat.

Reach TTMC7-1

Reach TTMC7-1 is a short 76 m feature that lacked definition and originated from a culvert that conveyed flows eastward across a private residential driveway just beyond the northeast corner of the Central Block subject site. The feature discharged into a roadside ditch on the south side of Twenty Road West. The ditch conveyed the water westward to join Branch TTMC-8 and

subsequently was piped through the residential development north of Twenty Road West. In the study area the feature was surrounded by meadow species and had no discernible bankfull channel. The feature width was 32.5 m, and during the spring visit the average wetted width and depth were 24.3 m and 0.03 m, respectively. Substrate in the feature was predominantly clay, silt, and sand. The flow regime of the feature was determined to be ephemeral given that water was only present during the first site visit.

5.5 Branch TTMC-8

The tributary originates in the golf course to the west of the UBE area and flows through the Central Block and a residential property, then runs parallel to Twenty Road West for approximately 40m. It then flows under Twenty Road West through a culvert and into a small woodlot and eventually into a residential stormwater pond through underground piping. From the stormwater pond it flows into the large hydro corridor north of the study area. The reaches within the study area provide no direct fish habitat, which is limited by the underground nature of the system downstream (north of Twenty Road West). This branch consists of two reaches (TTMC8-7 and TTMC8-9) within the UBE study area.

TTMC8-6

Reach TTMC8-6 is a 146 m long ephemeral swale that conveyed flows eastward towards Twenty Road West through the northern portion of the Central Block. Flows from the reach were conveyed across Twenty Road West before being piped through the residential development to the north. In the study area, the feature and riparian corridor consisted of a lawn. The majority of the reach was located on non-participating lands, and as such, measurements and substrate characterization were not collected.

TTMC8-7

Reach TTMC8-7 is a 120 m long intermittent swale that conveyed flows eastward through an agricultural field between two non-participating lands at the north end of the Central Block. The feature lacked a naturally vegetated riparian corridor and was predominantly cropped with sparse areas where no vegetation was present. Substrate was composed predominantly of clay, silt, sand, and sparse gravel. The feature had an average width of 2.55 m, and during the spring visit the average wetted width and depth were 2.4 m and 0.05 m, respectively.

TTMB8-8

Reach TTMC8-8 could not be observed or measured as it is located on non-participating lands, and trees blocked the line of sight from the adjacent agricultural fields.

TTMC8-9

Reach TTMC8-9 is a 306m long intermittent swale that conveyed flows eastward through an agricultural field at the northwest portion of the Central Block. Riparian vegetation consisted exclusively of agricultural crops, which were generally absent from the channel. Substrate composition was consistent with the adjacent fields, and was predominantly clay, silt, and sand. The reach was considered intermittent since water was present during the first and second visits, and the feature was dry during the summer. The average bankfull width of the feature was 2.6 m, and the average bankfull depth was 0.1 m. During the spring, the average wetted width of the feature was 2.39 m, with a corresponding average wetted depth of 0.03 m.

TTMC8-9-1

Reach TTMC8-9-1 is a 248 m long intermittent swale that conveyed flows northeast towards reach TTMC8-9 from the abandoned golf course through the west portion of the Central Block. The feature was surrounded by agricultural crops and was predominantly cropped. Water was present during the first and second visits and the feature was dry during the summer. The average bankfull width of the feature was 1.1 m, and the average bankfull depth was 0.2m. During the spring visit, the average wetted width and depth of the feature were 0.3 m, and 0.03 m, respectively.

TTMC8-3-3

Reach TTMC8-3-3 is a 283 m long intermittent swale that conveyed flows eastward through an agricultural field at the northwest corner of the Central Block. The feature lacked a naturally vegetated riparian corridor and was flanked by agricultural row crops, which encroached into the channel. Substrate in the feature was dominated by clay, silt, and sand. The low gradient feature lacked clearly defined banks, and had an average feature width of 2.65 m. During the spring, the average wetted width of the feature was 2.65 m with a corresponding average wetted depth of 0.04 m.

5.6 Management Recommendations

The classification results are summarized in Table 6, and the management recommendations for each reach in the Central and East Blocks are shown on Map 3. The management recommendations are defined as follows:

- Protection – The feature serves an important function to all criteria
- Conservation – The feature serves a valued function to all criteria
- Mitigation – The feature serves a contributing function to all criteria
- Recharge protection – The feature serves a groundwater recharge function in which flow is absent over sandy or gravelly soils
- Maintain or replicate terrestrial linkage – for features with terrestrial function only
- No management required – for features with limited or no function

'Modifiers' in Table 6 reflect local details that alter the form, function, or importance of the feature, such as downstream conditions or local anthropogenic influences. The management recommendations identified via strict application of the Headwater Guideline decision matrix have been adjusted to account for the modifiers. For instance, for those features that are located immediately upstream of pipes and/or stormwater management facilities, professional judgement was used to alter the classification recommendations to reflect the lack of downstream connectivity. The Headwater Guideline allows for these modifications through the following statement: "Classification should consider the influence of modifiers and professional judgement to determine the appropriate classification, where applicable. The results of the process need to be clearly articulated within the table" (TRCA and CVC 2014).

Table 6. HDF Classification and Management Recommendations

HDF Reach	Hydrology	Modifier	Riparian Conditions	Fish and Fish Habitat	Terrestrial Function	Original Management	Adjusted Management
TTMC-3							
3-2	Important	None	Important	Important	Important	Protection	*(no adjustment)*
3-2-1	Valued	None	Important	Contributing	Valued	Conservation	*(no adjustment)*
3-3	Contributing	None	Limited	Contributing	Limited	Conservation	Conservation
3-4	Contributing	None	Valued	Contributing	Limited	Conservation	Conservation
3-5	Valued	None	Limited	Important	Limited	Conservation	Conservation
3-6	Valued	None	Limited	Important	Limited	Conservation	Conservation
3-10	Valued	None	Important	Contributing	Important	Conservation	Conservation
TTMC-5							
5-4	Contributing	No downstream drainage feature	Important	Important	Important	Conservation	Conservation
5-5	Valued	No downstream drainage feature	Limited	Contributing	Important	Conservation	Conservation
5-6	Valued	No downstream drainage feature	Important	Contributing	Important	Conservation	Conservation
5-7	Value	No downstream drainage feature	Important	Contributing	Important	Conservation	Conservation
5-8	Valued	No downstream drainage feature	Limited	Contributing	Important	Conservation	Conservation
5-9	Important	No downstream drainage feature	Important	Contributing	Important	Conservation	Conservation
5-9-1	Valued	No downstream drainage feature	Limited	Contributing	Limited	No Management	*(no adjustment)*
TTMC-6							
6-1	Limited	No downstream drainage feature	Limited	Contributing	Limited	Mitigation	Mitigation
6-2	Contributing	No downstream drainage feature	Important	Contributing	Contributing	Mitigation	Mitigation
6-3	Contributing	No downstream drainage feature	Limited	Contributing	Limited	Mitigation	Mitigation
6-4	Contributing	No downstream drainage feature	Important	Contributing	Contributing	Mitigation	Mitigation
TTMC-8							
8-7	Limited	No downstream drainage feature	Limited	Contributing	Limited	Mitigation	*(no adjustment)*

HDF Reach	Hydrology	Modifier	Riparian Conditions	Fish and Fish Habitat	Terrestrial Function	Original Management	Adjusted Management
8-9	Valued	No downstream drainage feature	Limited	Contributing	Limited	Mitigation	*(no adjustment)*
8-9-1	Limited	No downstream drainage feature	Limited	Contributing	Limited	No Management	*(no adjustment)*
8-3-3	Valued	No downstream drainage feature	Limited	Contributing	Limited	Mitigation	*(no adjustment)*

6.0 Linkage Assessment

The term “Linkage” describes natural areas in the landscape that connect or support the function of Core Areas via an ecologically important corridor on a local or landscape scale (City of Hamilton 2015b). The RHOP and UHOP state that:

> [Linkages] are avenues along which plants and animals can propagate, genetic interchange can occur, populations can move in response to environmental changes and life cycle requirements, and species can be replenished from other natural areas.

Linkages mapped as part of the RHOP and UHOP may include woodlands, other natural vegetation types, and streams and watercourses that connect Core Areas (City of Hamilton 2012, 2013). Woodland Linkages are any natural or planted wooded area greater than 0.5ha that either connects Core Areas or lies within 100m of a Core Area. Other natural vegetation type Linkages are defined as meadows, thickets, and old fields that are at least 0.5ha and connect Core Areas or are within 100m of a Core Area. Streams and watercourses can function as Linkages when they connect Core Areas. Hedgerows can also provide a linkage function, especially where:

- The hedgerow is comprised of mature, healthy trees and generally provides a wide, unbroken linkage;
- There is evidence that wildlife regularly uses them as movement corridors or habitat;
- They contain tree species that are threatened, endangered, special concern, provincially or locally rare; or
- Groupings of trees are greater than 100 years old (City of Hamilton 2013).

Schedule B and AEGD Secondary Plan Map B.8-2 of the RHOP/UHOP show the location of Linkages in the City as identified using the above-noted criteria and approach. There are 4 of these mapped Linkages that overlap with the study area (Map 5). Studies completed for the EIS characterized the current form and function of these Linkages and informed refinements to their boundaries.

6.1 Linkage Characterization

A description of each Linkage is provided below. The cumulative results of numerous, multi-season field surveys conducted by NRSI biologists were used to ascertain wildlife presence,

abundance, and movement patterns and to inform this LA. For full details on the specific species observed, see the Wildlife section under Existing Conditions. For full details and species composition of the vegetation communities comprising the Linkages, see the Vegetation section under Existing Conditions.

Linkage 1

Linkage 1 (L1) is a hydro transmission corridor running east to west parallel with Twenty Road West (Map 5). Adjacent lands include road infrastructure, residential subdivisions, rural residences, agricultural fields, the naturalizing golf course lands, and a few small meadow and wetland areas. The corridor is approximately 25m wide and has poor (0-10%) vegetative cover in the study area. The corridor is mowed as part of infrastructure maintenance. This has limited the establishment of trees, and the vegetation community is dominated by grasses and forbs interspersed with a few shrubs. Pockets of the invasive Common Reed (*Phragmites australis*) are also present. Where agricultural lands are adjacent to the transmission corridor, row crops extend into L1 up to the road right-of-way. Significant traffic noise from Twenty Road West was observed by NRSI biologists.

In the west, L1 connects with a Core Area (Significant Woodland) west of Glancaster Road. In the east, L1 connects with a Core Area (Significant Woodland and PSW) via Linkage 4 (L4) (see below and Map 5). Therefore, L1 provides a direct, albeit lengthy and disturbed, connection between 2 Core Areas.

Signs and direct observations of wildlife by NRSI biologists during field surveys conducted between 2018 and 2020 were very limited in L1. It is likely that the close proximity to a busy road and a residential subdivision cause wildlife to avoid this area.

Linkage 2

Linkage 2 (L2) is a mature, mostly deciduous hedgerow that runs north to south along the eastern limit of the Central Block subject site (Map 5). Lands adjacent to L2 include agricultural fields, rural residences and outbuildings, a naturalizing orchard, and a small marsh. The hedgerow itself is approximately 5-10m wide, and is, in general, a single row of trees. Vegetative cover is moderate (30-50%), and is comprised of mainly deciduous trees with an herbaceous understory.

In the north, L2 connects with the transmission corridor, L1. In the south, L2 connects to a Core Area (Significant Woodland and PSW) via an old field and a wide hedgerow. L2 does not provide a direct connection between Core Areas, but in combination with adjacent naturalizing orchard and meadow areas it has the potential to provide some habitat connectivity on both a local and landscape scale.

In its northern extent, L2 contains a cluster of Honey-locust (a SCC). These trees were likely planted, or originated from planted individuals given their close proximity to a residential dwelling, and so would not be considered provincially significant individuals. In its southern extent, L2 contains a single Butternut (a SAR). Wildlife were observed using L2 and the adjacent naturalizing orchard in no discernable pattern. Bird and small mammal species dominated wildlife observations. There was no evidence of established wildlife trails or pathways running parallel to L2. Information from a local landowner in combination with observations of abundant tracks and established movement pathways suggested that a Coyote den may be present in or near an abandoned shack next to L2 (Map 5). A den was not confirmed by NRSI biologists; however, seasonally-elevated Coyote activity observed during field surveys in the immediate vicinity and elsewhere in the overall study area (including a number of live sightings) indicates that this species is potentially breeding in the study area. Coyote movement patterns were generally perpendicular to L2 (e.g. east to west), showing that Coyote cross this Linkage to access other nearby habitats rather than using the hedgerow as a linear corridor to access the Core Area in the south. Due to the absence of north-south (or vice-versa) wildlife movement along or within L2, the boundaries of the Linkage were adjusted to coincide with the HD vegetation community shown on Map 4, rather than being extended further south.

Linkage 3

Linkage 3 (L3) is comprised of 2 narrow deciduous hedgerows; 1 that runs north to south along the eastern limit of the East A Block subject site, and 1 that runs east to west outside of the study area (Map 5). Lands adjacent to L3 are comprised almost entirely of row crop agriculture. Both the north-south and east-west hedgerows are approximately 5-15m wide and are, in general, a single row of trees. Vegetative cover is moderate (20-50%), and is comprised of mainly deciduous trees with an herbaceous understory. The boundaries of L3 were adjusted based on NRSI field surveys to include the length of hedgerow that extends north towards Twenty Road West and south to the off site HDF (Map 5).

The extent of L3 mapped as part of UHOP Schedule B (City of Hamilton 2013) forms the central portion of a continuous hedgerow that runs all the way from Twenty Road West in the north to a small woodlot adjacent to Dickenson Road in the south. The east-west hedgerow portion of L3 connects the north-south hedgerow with the Core Area (Significant Woodland and PSW) east of the study area. L3 does not provide a direct connection between Core Areas, and based on the absence of any naturalized habitats east of L3, this Linkage is not likely to provide meaningful habitat connectivity on the local or landscape scale.

Signs and direct observations of wildlife by NRSI biologists during field surveys conducted between 2017 and 2019 were very limited within L3.

Linkage 4

Linkage 4 (L4) is a naturalized area comprised of deciduous woodland and thicket habitats next to the eastern boundary of the East B Block subject site (Map 5). Lands adjacent to L4 are agricultural fields (row crop), low-density residential properties, and PSW. L4 is approximately 5.5ha. Vegetative cover is high (60-100%), and is comprised of mainly deciduous shrubs, scattered trees and some small meadow areas. A network of mowed, off-road vehicle / ATV trails is present throughout L4, creating several narrow corridors between the naturalized thicket areas.

L4 is directly north of a Core Area (Significant Woodland and PSW); however, it does not provide any direct connections with other Core Areas. L4 connects to the eastern end of the hydro transmission corridor, L1. While L4 may provide some wildlife movement and plant propagation opportunities by connecting the Core Area with L1, this Linkage likely functions mostly as supporting and highly localized habitat (i.e. foraging, resting, dispersal) for species using the PSW in the Core Area.

Observations of wildlife within L4 were limited by property access during the majority of field surveys conducted by NRSI biologists.

6.2 Linkage Analysis

As per Section 5.0(c) of Hamilton's Linkage Assessment Guidelines, the LA must assess the ecological function, condition, viability, and integrity of each Linkage (City of Hamilton 2015b). Several factors are part of this evaluation. Each of these factors is summarized in Table 7, and management recommendations and rationale are provided in Table 8. Linkages overlapping

with the study area are degraded, and those that provide ecological connectivity do so only on a very localized scale. It is anticipated that the current function of the 4 Linkages will be accommodated within a wide, linear east-west corridor that will form part of the block-level NHS. A comprehensive enhancement and restoration plan for this corridor will include a mosaic of habitats and plantings of native trees, shrubs, and herbaceous species.

Table 7. Summary of Linkage Analysis

Hamilton Linkage Assessment Considerations	Linkage			
	L1	L2	L3	L4
Ecological Function				
Does the linkage currently connect Core Areas or other natural features?	Y	Y	N	Y
Does the linkage currently function as a wildlife movement corridor?	N	N	N	N
Is there evidence of widespread daily or seasonal use of the linkage by wildlife?	N	N	N	N
Does the linkage provide supporting habitat to Core Areas (e.g. foraging, resting, dispersal) for species living in Core Areas?	N	N	N	Y
Are uncommon or rare species using the linkage for any part of their life cycle?	N	Y	N	N
Condition				
Is the linkage largely free from degradation by anthropogenic activities?	N	N	N	N
Is the linkage wide enough to accommodate a meaningful ecological corridor?	Y	N	N	Y
Viability				
Is the linkage continuous vegetation community?	Y	Y	Y	Y
Does the linkage currently function on more than a very localized a scale?	Y	N	N	N
Is the linkage located along a corridor such as a stream, escarpment, or lakeshore?	N	N	N	N
Integrity				
Is the linkage important habitat by itself?	N	N	N	N
Can the surrounding land uses mitigate for negative impacts and potential stressors to the ecological functions of the linkage?	N	N	N	N

Table 8. Linkage Management Recommendations

Linkage	Management Recommendation	Rationale
L1	Replicate Function and Enhance Habitat	This feature provides a lengthy but direct connection between 2 Core Areas. It is continuous and wide enough to accommodate a meaningful ecological corridor, but the results of field surveys indicate that plants and wildlife do not currently use the transmission line to facilitate movement and propagation. This is likely due to the disturbed condition of the feature and its proximity to a busy road and residential subdivision. Since the feature provides some degree of connectivity at the larger landscape scale, management recommendations are to replicate the linkage function within the block-level natural heritage system. The replicated linkage should provide a wide corridor enhanced with restoration plantings along which plants and wildlife can forage, disperse, and complete life cycle requirements.
L2	Replicate Function and Enhance Habitat	This feature does not provide a direct connection between Core Areas, but in combination with adjacent naturalizing areas it has the potential to provide some habitat connectivity on the larger landscape scale. It is continuous but too narrow to accommodate a meaningful ecological corridor when considered on its own. Widespread daily and seasonal use of the feature by wildlife was observed by NRSI biologists due to the close proximity of the naturalizing orchard where wildlife activity was significantly elevated. However, wildlife movements were generally perpendicular to the hedgerow feature rather than parallel. Management recommendations are to replicate and enhance the linkage function within the block-level natural heritage system.
L3	None	This feature does not connect Core Areas or any other natural habitat, and is not used as a wildlife movement corridor. No management is recommended, since the feature does not provide any important habitats or ecological functions.
L4	Replicate Function and Enhance Habitat	This feature is directly adjacent to a Core Area (PSW and Significant Woodland) but does not provide any connection to other Core Areas or natural habitats. It may provide some wildlife movement and plant propagation opportunities by connecting the Core Area with ML1; however, this Linkage likely functions mostly as supporting habitat (i.e. foraging, resting, dispersal) for species using the PSW within the Core Area. Management recommendations are to replicate and enhance the linkage function within the block-level natural heritage system.

7.0 Conceptual Development Proposal

The UWSLG is submitting applications to expand the City of Hamilton Urban Boundary to include 4 areas within the UWS lands. These areas are located south of Twenty Road West on either side of Garth Street and the proposed Garth Street extension. This EIS and LA were prepared to support the UBE application, as is required by the City of Hamilton. Map 6 illustrates the proposed community framework plan. The proposed development consists of residential and mixed-use areas, supporting roads, and an NHS. The NHS contains woodlands, HDFs, unevaluated wetlands, the centralized pond, and VPZs. The plan is a conceptual block-level layout and further study will refine the layout of development, parks, amenities, the NHS and tree retention areas. The goal, at this time, is to present a conceptual plan for review by City and NPCA staff as part of the UBE application. The location and design of the road network is under evaluation as part of the Garth Street and Collector Roads EA.

Natural features in the East Blocks include hedgerows, small clusters of trees, and an old orchard. Core Area (including a PSW, Significant Woodland, other woodland, and HDFs) extends slightly inside the East 'B' Block, with the majority of features located immediately east of this block. Natural features in the Central Block include hedgerows, small clusters of trees, other woodlands, unevaluated wetlands, and HDFs. Natural features in the West Block include hedgerows, a small portion of a Significant Woodland in the southwest corner, unevaluated wetlands, and HDFs.

Urbantech Consulting has prepared a Stormwater Management Report for the UBE application, detailing the overall approach to managing runoff from future development in the overall UWS. The reader is directed to that report for detailed information on the proposed management strategies. In summary, the proposed drainage system incorporates an innovative dual drainage concept involving minor and major systems. Storm drainage subsystems will include:

- Low Impact Development (LID) conveyance controls (minor system); and
- Overland flow routes, stormwater management (SWM) dry ponds, etc. (major system).

The LID conveyance controls comprising the minor system will take the form of enhanced grass swales within the road right of ways (ROWs) and will be designed to remove excess surface

runoff produced by more frequent storms from lot-level source controls and ROWs, delivering it to end-of-pipe facilities.

Runoff flows in excess of the minor system LID swales will be conveyed via overland flow routes. This major system is largely comprised of roadways but may also include features such as swales, ditches, natural channels, drainage easements, and end-of-pipe SWM facilities. The proximity of the Hamilton International Airport requires that all SWM ponds on site be dry. Oil-grit separator (OGS) treatment units are proposed to achieve stormwater quality control objectives, as detailed in the Stormwater Management Report prepared by Urbantech.

8.0 Impact Analysis

8.1 Approach to Impact Analysis

Potential impacts arising from the proposed conceptual development are determined by comparing the details of the proposed undertaking with existing natural features and their ecological and hydrologic functions. Where the proposed undertaking overlaps with the natural features or their VPZs, impacts may arise. The current community framework plan and proposed NHS are shown on Map 6. This plan shows high-level land use designations, a road network, and the protected NHS. The impact analysis provided here is based on the conceptual design; refinements will occur at the Draft Plan stage when additional details are available. At this time, only high-level studies for have been completed for hydrology, hydrogeology, geotechnical, and stormwater management. Where possible, information from these studies has been integrated into this impact analysis.

The following is a description of the types of impacts that will be discussed:

- Direct impacts to natural features in the UBE Blocks associated with disruption or displacement caused by the proposed 'footprint' of the undertaking, based on the conceptual development plan;
- Indirect impacts associated with changes in site conditions such as drainage and water quantity/quality; and
- Induced impacts associated with post-development demand on natural resources created by increased habitation and use of the land and surrounding areas.

8.2 Direct Impacts

The community framework plan outlines an NHS that provides a single corridor for several natural features currently present in the UBE Blocks (Map 5). This corridor will contain 2 HDFs that traverse the subject sites in a west to east direction. As such, the HDFs will need to be re-aligned within this corridor. At this time, the proposed re-alignment will impact several small unevaluated wetlands along TTMC 5. These features are proposed for removal and re-creation within the NHS corridor. This removal and re-creation will be done under the NPCA policies for wetland reconfiguration and compensation (8.2.2.8). Further discussions will be held with the NPCA and City Natural Heritage Planner for the proposed HDF re-alignment and wetland reconfiguration. The assessment of HDFs in the West Block is incomplete at the time of writing, and management plans have not been determined for these reaches. The NHS does not currently incorporate the HDFs in the West Block. Therefore, the NHS will be subject to revision

and refinement following the completion of field surveys and natural heritage analyses. Additional details will be provided as part of the future revised EIS.

A number of trees in the UBE Blocks will be directly impacted based on the conceptual plan; however, the exact number is not known at this time, as specific details of the development have not been outlined. All trees in the Central and East Blocks have been inventoried by NRSI Certified Arborists and a TPP has been prepared (see Appendix IV). The TPP assumes that all trees within the proposed road alignments will be removed (51 trees) and recommends another 9 trees be removed based on their poor condition, but the status of the remaining trees within the development blocks is unknown at this time. Tree compensation for any removed trees will be provided in the NHS within the overall UWS lands, which means that compensation may be located elsewhere within the block and not necessarily within the subject sites. As per the City of Hamilton's Tree Protection Guidelines (2010), street trees planted as part of the proposed development will also be credited as compensation plantings. Following the completion of the ongoing tree inventory in the West Block, the TPP will be revised to include all relevant information for the entire UBE study area.

Fourteen (14) Butternuts were found within the Central and East Blocks. At this time, it is assumed that 3 of these trees will be removed as part of the proposed development. As detailed in this report and the TPP, Butternut Health Assessments have been completed for 9 of the Butternuts within the subject sites. The remaining trees will be assessed in upcoming years as survey work continues in the UWS lands. Hybridity tests are underway to determine if any of these trees are hybrids. This information will factor into the Butternut Health Assessments and the determination of the category and subsequent protection requirements for each tree. As this analysis is not yet complete the details are not provided in this report. Tree buffers, removal, and potential compensation will factor in to further studies in the UBE subject sites for the Draft Plan and detailed design stages.

Trees with potential bat habitat are present throughout the subject sites. These comprise trees that have potentially suitable cavities, cracks, or other habitat features used by tree-roosting bat species, and oak and maple trees with the potential to form leaf clusters potentially used by Tri-colored Bat. Several of these trees are located in the subject sites and outside of the NHS, and may be directly impacted by the proposed development. Further detailed assessment to identify which will require removal, will be required at the Draft Plan or detailed design stage. Since these trees have the potential to provide habitat for SAR bats, the need for any further study of

these trees will be determined in consultation with MECP, and may include bat exit surveys and/or acoustic monitoring to confirm their use by SAR bats. It is anticipated that seasonal timing windows will be required for tree removal (i.e., no removal of potential bat habitat trees within the bat active period of May 1-September 30) to ensure that no SAR bats are harmed during removal. At future development stages, additional investigations of on-site structures will also be required prior to their removal to ensure that no SAR bats are harmed during demolition.

Barn Swallow was observed nesting within the abandoned rural dwelling at the centre of the East 'B' Block and in the golf course clubhouse in the West Block. This species and its general habitat are protected under the ESA; however, an exemption can be obtained under Ontario Regulation 242/08 provided that a notice of activity is submitted on the Environmental Registry of Ontario. The development of comprehensive mitigation plans, which typically include the replacement of Barn Swallow nesting and foraging habitat elsewhere on site, will be required as part of the application for exemption. A detailed compensation plan for Barn Swallow will be developed in consultation with the MECP, and will follow relevant best management practices and guidelines. Compensation habitat will be located within the NHS found on the subject sites.

8.2.1 Linkage Impact Assessment

The LA detailed in the EIS provides a framework for discussing relevant impacts to, and mitigation measures for, any of the City-mapped Linkages providing an ecological function within the study area. This framework will also inform the eventual location and design of the NHS during future design stages.

Several Linkages overlap with the subject sites and may require removal to accommodate the proposed development. However, given the poor condition and lack of landscape-level functionality, opportunities to replicate, reconfigure, and restore the linkages within the study area are likely to result in a net ecological benefit. The Conceptual Block Plan shown on Map 6 incorporates an NHS that will be designed to provide movement and propagation opportunities for vegetation and wildlife within the study area. The establishment of a wide, linear east-west corridor enhanced with restoration plantings and other habitat features (e.g. brush piles, watercourses, wetland areas) will replicate the linkage function of the features considered in the LA.

In addition to the considerations provided in Hamilton's Linkage Assessment Guidelines (City of Hamilton 2015b), provincial guidance from the Natural Heritage Reference Manual is also

important to consider in the context of locating and designing linkage components of any natural heritage system (OMNR 2010). A detailed analysis and discussion of how the proposed NHS of a future development will accommodate these guidelines will be provided at a future development stage.

8.3 Indirect Impacts

Indirect impacts are identified as effects that are not a direct result of the proposed development footprint and are often produced in areas surrounding or adjacent to the development footprint or as a result of complex impact pathways. Potential sources of indirect impacts associated with the proposed development may include:

- Changes to the local water balance;
- Changes to surface water flow patterns;
- Changes to groundwater recharge and discharge;
- Changes to water quality;
- Erosion and sedimentation during construction; and
- Indirect impacts to wildlife and vegetation communities.

The majority of these indirect impacts will be addressed at future development stages when specific details about the development (e.g. grading, stormwater management, servicing) become available. Due to the high-level scope of the relevant engineering reports and plans prepared for the UBE proposal, a general overview of anticipated indirect impacts is provided below.

8.3.1 Water Balance

A feature-based water balance analysis will be required at a future development stage to ensure that key natural and hydrological features (e.g. wetlands, watercourses) continue to receive sufficient water inputs under the post-development scenario. A water balance analysis should be completed for features remaining in place as well as those that are proposed to be created within the NHS. To achieve a balanced condition, mitigation measures will be required. These may include LID techniques for infiltration and flow conveyance, the use of clean rooftop runoff, and design considerations for HDF realignment that are compatible with a balanced water budget.

Under proposed conditions, the Twenty Mile Creek culvert outlets along Twenty Road West will be largely consolidated into one major storm outlet that will service the UWS lands tributaries to

Twenty Mile Creek (i.e. the onsite HDFs). Some minor drainage will be maintained to the tributaries north of Twenty Road West to maintain environmental features and protect the riparian rights of downstream landowners. LID Best Management Practices (BMPs) will be designed to match pre-development infiltration, evapotranspiration, and runoff wherever possible. Detailed information related to locations and sizing of LID BMP features will be provided at future design stages (A. Fata, Urbantech, pers. comm.).

8.3.2 Surface Water Flow Patterns

The subject sites contain several headwater and wetland features that rely on surface water inputs. It is anticipated that existing drainage patterns will be significantly altered by grading under any post-development scenario. In combination with the water balance analysis, future studies will need to assess the impacts of changes in surface water flow patterns on all relevant ecological receivers, and to ensure that existing drainage patterns on adjacent lands will not be altered.

8.3.3 Groundwater Recharge and Discharge

Using the results of the water balance analysis, future impact assessments at the Draft Plan or detailed design stage should confirm whether runoff and infiltration from the development site will be maintained under post-development conditions. Future analysis will incorporate the contribution of LID infiltration systems to maintain a water balance. Groundwater levels and movement patterns should be determined through engineering studies, and potential short- or long-term impacts to near-surface and groundwater quantities due to any during-construction dewatering requirements will need to be addressed and mitigated for as needed.

8.3.4 Water Quality

The stormwater management strategy for future developments within the subject sites will need to ensure that vulnerable ecological receivers such as existing or created wetlands and watercourses are adequately protected from contamination. Technology such as oil/grit separators and LID techniques (bioswales, infiltration trenches) are recommended to manage stormwater quality on site. Specific details on water quality targets and mitigation measures will be provided at the future development stage.

8.3.5 Erosion and Sedimentation During Construction

To protect on-site and off-site natural features from potential impacts at future development stages, an Erosion and Sediment Control Plan (ESCP) must be developed and implemented

prior to any construction activities on-site. The primary principles associated with erosion and sedimentation protection measures are to: (1) divert runoff away from exposed soils, (2) reduce runoff velocities to minimize erosion and encourage sediment to settle out, (3) retain existing vegetation, where feasible, and for as long as possible before disturbance, (4) minimize the duration that bare soil is exposed, (5) encourage the quick re-vegetation and stabilization of bare soil, and (6) trap sediment as close to the source as possible.

The following actions are recommended to limit potential for erosion and sedimentation from construction areas:

- installation and maintenance of erosion control silt fencing around the perimeter of any construction or area grading operations;
- regular inspection and monitoring of all erosion control measures by the contractor, particularly before and after large rain events (>10mm), with repairs completed as required;
- operation and storage of all materials and equipment away from natural features and watercourses and in a manner that prevents any deleterious substance from leaving the site;
- strategic timing of stripping, grubbing, and grading activities to reduce the duration of bare soil exposure
- strategic placement of topsoil stockpiles away from natural features and watercourses, and in low wind areas, if possible,
- establishment of vegetation on stockpiles to reduce erosion potential and placement of erosion control fencing around all stockpile areas;
- stabilization and re-vegetation of bare soil areas after construction is complete as soon as possible (avoid attempting to establish vegetation in the summer and winter months, use other stabilization measures until appropriate planting conditions are present); and,
- installation of a mud mat at the primary construction entrance to minimize the amount of mud being tracked onto the roadway; the use of dust suppressants may also be appropriate.

Soil compaction in and adjacent to natural areas can be reduced and avoided by establishing designated equipment routes, clearly identifying protected areas, and locating material stockpile and equipment storage locations away from protected areas.

An environmental inspector is recommended to ensure that the erosion and sediment control measures are installed, maintained and functioning as intended, and that natural features are protected.

8.4 Induced Impacts

Induced impacts are described as those that are not directly related to the construction or operation of a particular development, but rather arise from the use of the natural areas as a result of the development. The simplest example is an increase in the use of natural areas adjacent to a residential development by residents, feral and human-subsidized wildlife and pets, and unauthorized trail/pathway construction. Natural areas and wildlife can be affected by the presence of residences and their occupants. Effects can include vegetation trampling, plant removal, dumping of refuse, creation of unauthorized trails, tree damage, introduction of non-native plant species and wildlife predation and harassment by domestic pets. Dense plantings of native trees and shrubs within Vegetation Protection Zones (VPZs) will help to discourage human intrusion into natural features.

The NHS within the Conceptual Block Plan (Map 6) will be designed at future development stages to incorporate specific areas that people can access and enjoy, such as parks and community trails adjacent to natural areas. Parks and community trails help to reduce the amount of unauthorized access to adjacent natural features and areas by focusing use on authorized trails and park space. The use of physical barriers such as dense vegetation plantings and/or permanent fencing may also be considered to reduce unauthorized access to significant natural features. Education with respect to the value and function of the neighbouring natural areas is another tool that can be used to avoid induced impacts. Interpretive, educational signage should be used for natural features and areas adjacent to future proposed development.

Road salt use and the draining of pool water directly into the storm sewers can results in high concentrations of chloride in wetlands and watercourses. At the detailed design stage, a Salt Management Plan may be developed that provides guidance and management recommendations for mitigating potential chloride impacts. Specific to the residential portions of the Conceptual Block Plan, a homeowner's brochure should also be developed for distribution

to residences located next to the NHS. These brochures will provide information to homeowners on best management practices to follow when living next to a natural area.

8.5 Cumulative Impacts

In order to evaluate the potential for cumulative impacts resulting from proposed development in the subject site, it is necessary to look beyond the boundaries of the study area to the neighbouring lands. This approach looks at the character and potential changes that are occurring or may occur in the future on surrounding lands in vicinity. It is important to recognize the ecological significance of the natural features within the study area in the larger landscape context and identify potential cumulative effects from the proposed development.

At this time, NRSI is aware of several development applications within 2km of the study area. The Garth Street Draft Plan of Industrial Subdivision application is underway for the lands in between and south of the Central and East A blocks; the community plan and proposed NHS shown in this UBE EIS are integrated into the Garth Street Draft Plan. Portions of the St. Elizabeth Mills residential complex, 1km north of the study area on Rymal Road West, are proposed for re-development, and stormwater management infrastructure upgrades within that community are anticipated. The re-development of the Bishop A. Tonnos Stations of the Cross Park on Rymal Road West is also underway. A review of aerial imagery indicates that subdivision planning may also be underway for the property located southwest of the Upper James Street and Dickenson Road intersection, east of the airport. No cumulative impacts are anticipated due to any of the above-listed developments.

To the north, lands within 2km of the study area are highly developed with residential subdivisions. South of the study area, the airport dominates the landscape alongside a few rural residences and active agricultural fields; natural features are limited. Changes to land use resulting from the incorporation of the subject site into the Hamilton urban boundary are not expected to result in cumulative impacts to natural features at a broad scale based on implementation of the recommended NHS within the UBE lands.

9.0 Mitigation Measures

9.1 Vegetation Protection Zones

VPZs are required for natural heritage features such as woodlands, wetlands, SWH, watercourses, and ponds to protect them from indirect and induced impacts resulting from development and land use changes. A Municipal Comprehensive Review (MCR) application was submitted to the City of Hamilton in September 2017. As part of this application, VPZs were identified for natural features within the UWS participating lands. VPZ widths were determined based on a review of background information, including the UHOP and RHOP, AEGD Secondary Plan and Subwatershed Study, and NPCA policies. The AEGD Secondary Plan policies 8.5.1, and 8.14.33, direct back to the UHOP Section C.2 – Natural Heritage System, and specifically Sections C.2.5.9 to C.2.5.15 inclusive of Volume 1. As such, the VPZs identified in the UHOP were applied as appropriate. Table 9 summarizes the VPZs identified for each natural feature within the subject site.

The VPZs function as an area of physical separation between the development, future residents and land uses, and the natural features. Human activity and interaction with natural areas within the subject sites will be focused at specific locations, such as schools, trails and general open space, so that residents can enjoy natural and open space areas, and sensitive natural features can be protected in the NHS. The NHS includes the VPZs identified in Table 9, which includes other woodlands, HDFs, unevaluated wetlands and PSWs, and the centralized pond. Environmental constraints shown on Map 1 are consistent with the recommended VPZ widths summarized in Table 9.

Table 9. Vegetation Protection Zones

Natural Feature	Recommended Vegetation Protection Zone Width	UHOP Reference for Buffer Width
Upper Twenty Mile Creek Provincially Significant Wetland Complex	30m	UHOP Section C.2.5.10
Unevaluated Wetlands	15m	UHOP Section C.2.5.10
Aquatic Habitat (Seasonal/Warmwater / Important/Marginal Fish Habitat)	15m	UHOP Section C.2.5.10
Significant Woodlands	15m*	UHOP Section C.2.5.10 *AEGD Subwatershed Study (Dillon Consulting Ltd. and Aquafor Beech Ltd. 2011) recommends a 30m buffer for Core

		Natural Areas identified on Figure 2.15 of that report; Significant Woodlands within or adjacent to the UBE Blocks are designated as part of Core Areas, and so a 30m buffer is identified for these features on the constraints mapping of this EIS (Map 1).
Other Woodlands	10m	UHOP Section C.2.5.10

The block plan is conceptual. Should the City accept the UBE applications, a Secondary Plan followed by Draft Plans and detailed designs will be prepared, along with associated environmental reports, that will provide more detail for natural heritage protection and planning. As more details are available within each subject site, and when the final road locations have been determined through the EA process, further analysis will be conducted to ensure development and grading activities respect the identified VPZs. NRSI will work with the project team to ensure that VPZs widths are maintained and the NHS is protected. Specific restoration and enhancement plans for established VPZs will be developed pending future studies and specific development design plans at the Draft Plan stage.

9.2 Natural Heritage System

The NHS of the Conceptual Block Plan shown within the UBE Blocks on Map 6 forms part of a larger, block-level NHS. The lands within the block-level NHS provide important opportunities for mitigating potential impacts to natural features and wildlife, as well as habitat creation and enhancement. The conceptual block-level NHS will be designed to include a mosaic of meadow, thicket, woodland, wetland, and aquatic habitat focused along a wide, linear east-west corridor. It will include existing natural features and their VPZs, including meadow marshes, ponds, successional thickets (i.e. parts of the naturalizing orchard), and small woodlots. Since these existing habitats are of generally poor quality, they will be enhanced through native tree, shrub, and herbaceous plantings, invasive species management, soil amendments, and debris removal where needed. Several habitats or features are also anticipated to be re-aligned or created within the NHS, including:

- Meadow marsh wetland features to replace any non-PSW wetlands proposed for removal under future development scenarios and in accordance with NPCA and City policies;
- Realigned HDFs that will form a generally parallel pair of intermittent watercourses;
- Riparian habitats associated with the realigned HDFs
- Upland meadows;

- Small woodlots or hedgerows; and
- Habitat features supporting the needs of wildlife such as cover objects and brush piles for snakes and small mammals, snags, and bird nesting structures.

The block-level NHS will provide a naturalized avenue along which plants and wildlife can forage, disperse, and propagate. It will connect the small central Core Area (surrounding the pond in the old orchard, see Map 5) with the Core Area (PSW and Significant Woodland) east of the East 'B' Block. In addition to providing this important ecological linkage function, the NHS corridor will also provide supporting habitat to the Core Areas and offer "stepping stone" features for mobile wildlife. Given the poor condition and lack of landscape-level functionality of the Linkages discussed in the Linkage Assessment, opportunities to replicate, reconfigure, and restore the existing linkages within the block-level NHS are likely to result in a net ecological benefit.

10.0 Recommendations for Further Study

Several additional studies are recommended throughout this report that will be required at future Draft Plan or detailed design stages to fill current knowledge gaps and provide a thorough understanding of potential impacts related to each proposed undertaking. The following studies are recommended to be completed by proponents of future development applications within the UBE Blocks:

- Targeted vegetation and wildlife surveys conducted as needed within appropriate seasonal timing windows, as per City of Hamilton EIS Guidelines (2010);
- Ongoing assessment and surveys of SAR, SCC, and their confirmed or potential habitats within the UBE Blocks;
    - Consultation with the MECP will be required at future development stages to determine the approach to addressing SAR and their habitats. Correspondence with the MECP regarding the overall UWS lands and the results of field surveys to date has been initiated as of May 1, 2020 (Appendix XI).
- Detailed hydrological studies;
- Detailed hydrogeological studies; and
- Feature-based water balance analyses.

Other studies may be required by agency staff for future development applications, which will be defined through the pre-consultation and TOR processes. Detailed habitat enhancement, edge management, and landscape planting plans for all VPZs and the overall NHS are anticipated at future development stages.

Recommendations for further study will be updated and refined as part of the future revised EIS following the completion of field surveys in the West Block.

11.0 Conclusions

Natural Resource Solutions Inc. (NRSI) was retained by the Upper West Side Landowners Group (UWSLG) to complete an Environmental Impact Study (EIS) and Linkage Assessment (LA) in support of the proposed Urban Boundary Expansion (UBE) for several sites south of Twenty Road West in Hamilton, Ontario. The UWSLG is proposing the addition of 4 areas to the City of Hamilton's urban area lands classification. The subject sites are located directly south of Twenty Road West and are defined as; East 'A' and East 'B', Central and West Blocks. This report provides a summary of the natural features within each subject site, a description of the proposed land use changes, a high-level analysis of impacts based on the Conceptual Block Plan, and a general discussion of mitigation measures.

Natural heritage features within or immediately adjacent to the study sites include the following:

- Upper Twenty Mile Creek PSW Complex;
- Unevaluated wetlands;
- Significant Woodland;
- Other woodlands;
- Hedgerows and isolated trees;
- Naturalizing thicket (abandoned orchard);
- Naturalizing meadow (abandoned golf course); and
- Headwater Drainage Features.

During field surveys, NRSI biologists documented 2 SAR, Barn Swallow and Butternut, and several provincially (i.e. SCC) and regionally rare species. Confirmed Turtle Overwintering SWH was also present on site, specifically within the West Block. Potential impacts to these species and habitats are anticipated to be mitigated by the retention of specific natural features, and the creation and enhancement of habitats within a block-level NHS that will be designed at a future development stage. Likewise, the NHS will provide a linkage function allowing wildlife to continue foraging, dispersing, and carrying out life cycle requirements under a post-development condition.

Recommendations for future studies to be completed as part of specific development applications are provided.

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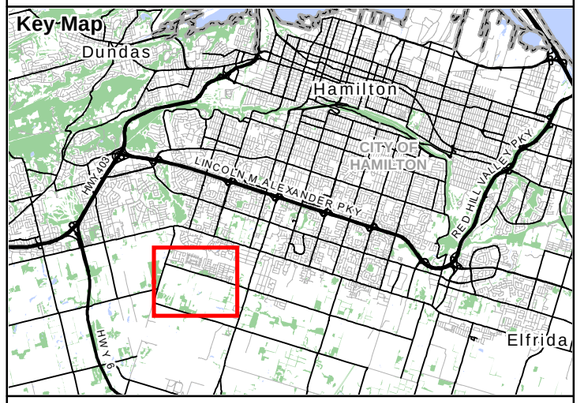
Maps

Map 1

Upper West Side Urban Boundary Expansion

Study Area and Environmental Constraints



Legend

- Subject Site
- Study Area
- Provincially Significant Wetland (PSW)
- PSW Buffer (30m)
- Other Wetland
- Other Wetland Buffer (15m)
- Other Woodland
- Other Woodland Buffer (10m)
- Significant Woodland (Aquafor Beech 2017)
- Significant Woodland Buffer (30m)
- Headwater Drainage Feature
- Watercourse Buffer (15m)
- Water Body

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Project: 1974E
Date: June 15, 2020

NAD83 - UTM Zone 17
Size: 11x17"
1:9,000

0 100 200 300 400 500 Metres

N

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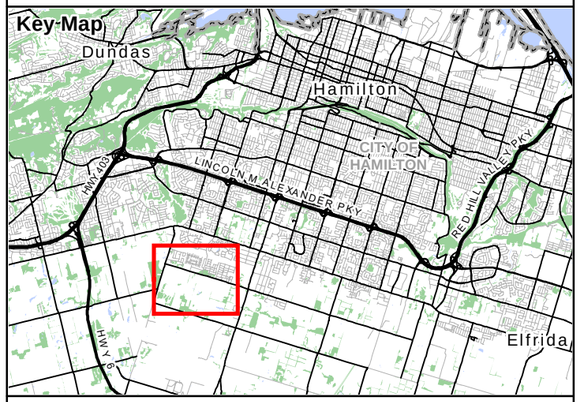
Map 2

Upper West Side Urban Boundary Expansion

Monitoring Stations



Legend

- Subject Sites
- Study Area
- Water Body

2018 Monitoring Stations

- Breeding Bird Survey (BBS)
- Marsh Breeding Bird Survey (MBB)
- Snake Cover Board Location (SNK)
- Anuran Monitoring Station
- Turtle Nesting Habitat Assessment Area

2020 Monitoring Stations

- Snake Cover Board Location (SNK)
- Anuran Monitoring Station

Monitoring Stations in the West Block represent field work completed up until May 31, 2020. Additional information will be provided upon completion of the 2020 field work program.

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Project: 1974E
Date: June 15, 2020

NAD83 - UTM Zone 17
Size: 11x17"
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0 100 200 300 400 500 Metres

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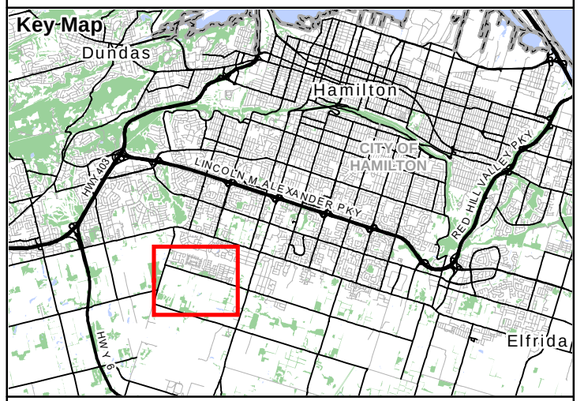
Map 3

Upper West Side Urban Boundary Expansion

Headwater Drainage Features



Legend

- Subject Sites
- Study Area
- Primary Road
- Secondary Road
- Watercourses (GEO Morphix 2019)

Headwtaer Drainage Feature Management (GEO Morphix and NRSI 2019)

- Protection
- Conservation
- Mitigation
- No Management Required
- Management recommendations to be determined following completion of 2020 assessments
- Drainage Feature (outside study area)
- Piped Drainage Feature (outside study area)
- Reach Break

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Project: 1974D
Date: June 15, 2020

NAD83 - UTM Zone 17
Size: 11x17"
1:9,000

N

0 100 200 300 400 500 600 Metres

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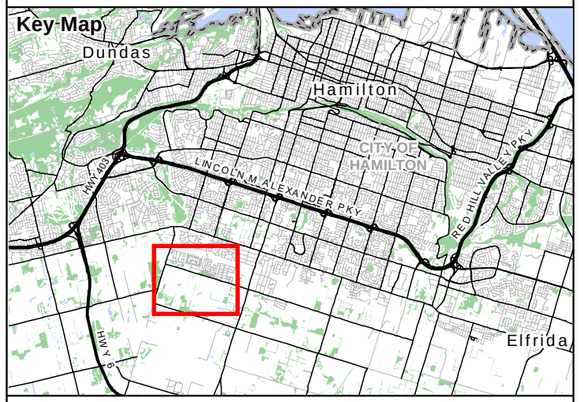
Map 4

Upper West Side Urban Boundary Expansion

Vegetation Communities



Legend

- Subject Sites
- Study Area
- Primary Road
- Secondary Road
- Permanent Watercourse
- Intermittent Watercourse
- Ecological Land Classification (ELC)

(Ag) Agriculture
(CUM) Cultural Meadow
(CUM1) Mineral Cultural Meadow Ecosite
(CUT1-4) Gray Dogwood Cultural Thicket Type
(CUW) Cultural Woodland
(CUW1) Mineral Cultural Woodland Ecosite
(FOD4) Dry - Fresh Deciduous Forest Ecosite
(FOD5-6) Dry - Fresh Sugar Maple - Basswood Deciduous Forest Type
(FOD8-1) Fresh - Moist Poplar Deciduous Forest Type
(HC) Coniferous Hedgerow
(HD) Deciduous Hedgerow
(MAM2-2) Reed-canary Grass Mineral Meadow Marsh Type
(MAS2-1) Cattail Mineral Shallow Marsh Type
(Orchard) Naturalizing Orchard
(Res) Rural Residential Dwelling
(SAF1) Floating-leaved Shallow Aquatic Ecosite
(SWD3-3) Swamp Maple Mineral Deciduous Swamp Type

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Aquatic, Terrestrial and Wetland Biologists

Project: 1974D
Date: June 17, 2020

NAD83 - UTM Zone 17
Size: 11x17"
1:9,000

0 100 200 300 400 500 600 Metres

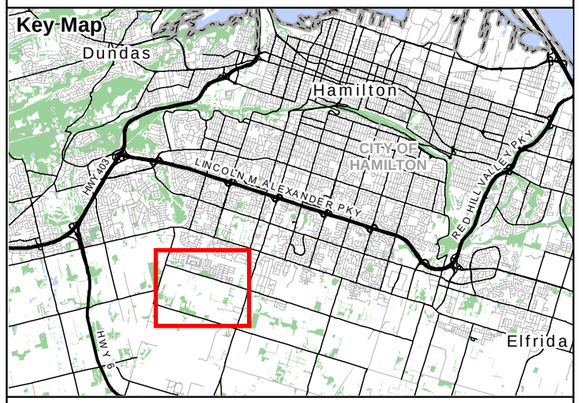
N

Path: X:\1405_TwentyRdLandownersGroupAssessments\NRSI_1974E_Map4_UBE_ELC_2020_06_17_KEF.mxd

Map 5

Upper West Side Urban Boundary Expansion

Linkage Assessment



Legend

- Subject Sites
- Study Area
- Linkage*
- Candidate Coyote Den Site
- Primary Road
- Secondary Road
- Headwater Drainage Feature
- Core Area*
- Provincially Significant Wetland (PSW)
- Woodlot

*As per City of Hamilton Urban and Rural Official Plan (2012, 2013) Schedule B and AEGD Secondary Plan Map B-8.2

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1974E
Date: June 17, 2020

NAD83 - UTM Zone 17
Size: 11x17"
1:10,000

0 100 200 300 400 500 600 Metres

N

586500 587000 587500 588000 588500 589000 589500

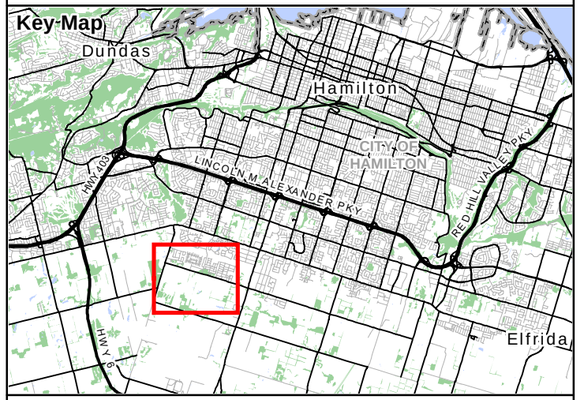
4783500 4783000 4782500 4782000 4781500

Path: X:\1405_TwentyRdLandownersGroupAssessments\NRSI_1974E_Map5_UBE_LinkageAssessment_8K_2020_06_17_KEF.mxd

Map 6

Upper West Side Urban Boundary Expansion

Conceptual Block Plan



Legend

- Study Area
- Subject Properties
- Non-Participating Lands
- Residential Lands
- Mixed Use Lands
- Natural Open Space
- Airport Light Industrial (AEGD)
- Airport Prestige Business (AEGD)
- SWM
- Major Internal Roads
- Primary Road
- Secondary Road
- Permanent Watercourse
- Intermittent Watercourse
- Water Body

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Aquatic, Terrestrial and Wetland Biologists

Project: 1974E
Date: June 16, 2020

NAD83 - UTM Zone 17
Size: 11x17"
1:9,000

N

0 100 200 300 400 500 600 Metres

586500 587000 587500 588000 588500 589000

4784000 4783500 4783000 4782500 4782000

Path: X:\1405_TwentyRdLandownersGroupAssessments\NRSI_1974E_Map6_UBE_ConceptualBlockPlan_7K_2020_06_16_LEH.mxd

Appendix I
Draft Terms of Reference and Agency Comments

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

May 14, 2020 Project No. 1974E

Melissa Kiddie
Natural Heritage Planner
Development Planning, Heritage and Design
Planning and Economic Development Department
71 Main Street West, 5th Floor
Hamilton, Ontario L8P 4Y5

Sarah Mastroianni
Senior Watershed Planner
Niagara Peninsula Conservation Authority
250 Thorold Road West; 3rd Floor
Welland, Ontario L3C 3W2

Dear Ms. Kiddie and Ms. Mastroianni,

Re: Upper West Side: Urban Boundary Expansion
Natural Heritage Studies Terms of Reference

On behalf of the Upper West Side Landowners Group (UWSLG), Corbett Land Strategies (CLS), and Natural Resource Solutions Inc. (NRSI), I am pleased to provide the following Terms of Reference (TOR) for natural heritage studies to support the Upper West Side (UWS) Urban Boundary Expansion (UBE) application. Several rural areas within the overall UWS block of lands are proposed for inclusion within the urban boundary of the City of Hamilton. These are:

- *East 'A' Block:* 9825 and 9445 Twenty Road West (FC-20-028)
- *East 'B' Block:* 9511 Twenty Road West (FC-20-028)
- *Central Block*: 9751-9625 Twenty Road West (FC-20-029)
- *West Block:* 555 Glancaster Road (FC-20-034)

Map 1 attached illustrates the extent of each UBE Block. The required natural heritage studies include an Environmental Impact Statement (EIS), Linkage Assessment (LA) and a Tree Protection Plan (TPP). This is the first submission of a TOR for these studies for the purposes of the UBE.

Upper West Side Development Application Overview

On September 15, 2017, a submission was made to the City of Hamilton (City) for the Municipal Comprehensive Review (MCR) GRIDS 2 Process Employment Lands Review. This was to pursue the conversion of approximately 109 acres of employment land to mixed-use and compact residential land in the block of lands bounded by Twenty Road West to the north, Upper James Street to the east, Dickenson Road to the south, and Glancaster Road to the west. These lands are referred to as the UWS.

Preliminary community plan concepts for the UWS lands have been formulated by the UWSLG and continue to be refined with input from members of the planning and technical project teams. This high-level approach ensures the appropriate and comprehensive planning and design of all

development proposed in the UWS lands. The following summarizes the anticipated development and planning processes, and applications that have, or will be, initiated by the UWSLG:

- MCR, submitted September 15, 2017;
- Garth Street Industrial Subdivision Draft Plan Formal Pre-consultation and initial submission, dated July 2018 (UHOPA-18-016; ZAC-18-040; 25T-201807);
- Schedule 'C' Class Environmental Assessment (EA) TOR, submitted July 8, 2018
- Schedule 'C' Class EA, first submission pending
    - EA for the extension of Garth Street and associated Collector Road Network in the UWS block; integrated with the Garth Street Industrial Subdivision application.
- UBE Formal Pre-consultation Application, March 2020
    - Submission for 3 "white belt" parcels in the City of Hamilton rural boundary, referred to as the "East", Central", and "West" blocks
- Secondary Plan and Official Plan Amendments (OPAs)
    - Following the submission of the UBE applications for the 3 above-noted "white belt" areas;
- Garth Street Industrial Subdivision Draft Plan Application re-submission, pending; and
- Additional Draft Plans of Subdivision, pending.

NRSI was retained by the UWSLG to complete natural heritage studies to support the various applications listed above. Each application will be dealt with separately. The TOR contained herein is specific to the UBE proposal (FC-20-028; FC-20-029; FC-20-034).

Urban Boundary Expansion – Previous Submissions

The Formal Pre-consultation Application for the UBE was submitted by the UWSLG in early March, 2020. This submission included a preliminary EIS prepared by NRSI, dated February 27, 2020. Comments related to natural heritage studies were received from the Niagara Peninsula Conservation Authority (NPCA) on April 7, 2020 and from City of Hamilton Natural Heritage Planning staff on April 14, 2020. This TOR has been prepared to address agency comments received in response to the March 2020 Pre-Consultation Application.

Urban Boundary Expansion Proposed Undertaking

The UBE Blocks described above are currently within the City of Hamilton's rural boundary. The UWSLG is preparing an application to move these blocks into the City's urban boundary. As part of this application, several reports will be prepared and/or updated to provide technical and planning support. These blocks will form key components, allowing for road connections off of Twenty Road West, and integration of communities and employment lands through the remainder of the UWS block. The proposed development in the UBE Blocks consists of a road network, compact residential development and portions of a connected and continuous Natural Heritage System (NHS). The layout of the road network is currently under study through the Garth Street and Collector Roads EA, which will be integrated with the Garth Street Industrial Subdivision application.

Natural heritage studies completed and underway for the UBE will evaluate the characteristics of the natural environmental features and functions in the study area, identify opportunities and constraints to the proposed development, assess potential impacts to natural features and functions based on the proposed development, and provide recommendations and mitigation measures where needed. The EIS and LA will be prepared in accordance with the City of Hamilton's EIS Guidelines (March 2015) and the Linkage Assessment Guidelines (March 2015). The TPP will be prepared in accordance with City of Hamilton's Tree Protection Guidelines (Appendix "A" to Report PD02229 (f) 2010).

Study Area

The UBE Blocks total nearly 90ha in the rural boundary of the City of Hamilton. These blocks are excluded from the Airport Employment Growth District (AEGD) Secondary Plan (City of Hamilton 2017). These lands are included in the Rural Hamilton Official Plan (RHOP) (City of Hamilton 2012) and are comprised of actively farmed agricultural fields, a naturalized orchard, hedgerows, headwater drainage features (HDFs), a small woodlot, and an inactive golf course. No Linkages are mapped on RHOP Schedule B – Natural Heritage System in the study area; however, the hydro corridor immediately north of the UBE Blocks is mapped as a Linkage on Schedule B – Natural Heritage System in the Urban Hamilton Official Plan (UHOP). The study area includes several HDFs that are part of the Twenty Mile Creek watershed. All watercourses in the subject site are classified as Seasonal/Warmwater Type 2 Important Fish Habitat according to NPCA mapping (A. Parks, *pers. comm.*). The term "subject sites" refers to 4 blocks, East A, East B, Central, and West, that contain the extent of the proposed UBE. The term "study area" refers to the subject sites plus the surrounding 120m. The study area was selected based on the definition of "adjacent lands" provided in the Natural Heritage Reference Manual (MNRF 2010), and allows the assessment of potential impacts on all relevant ecological receivers. The study area and subject sites are shown on Map 1.

Collection and Review of Background Information

In the study area, information that could be gathered (without direct access to the lands outside of those owned by the proponent) was collected and reviewed. Legacy data collected from agencies and wildlife atlases encompassed an area of approximately 1km around the property (or in the case of the wildlife atlases, in the 10km x 10km atlas square that overlaps with the study area).

Background information was collected and reviewed to identify key natural heritage features, habitats, and species that are reported from or have the potential to occur in the study area. The following sources were consulted:

- Natural Heritage Information Centre (NHIC) database (MNRF 2019a);
- City of Hamilton Rural Official Plan (RHOP) (2012);
- City of Hamilton Urban Official Plan (UHOP) (2013);
- Twenty Mile Creek Watershed Plan (NPCA 2006);
- City of Hamilton Natural Areas Inventory Project 3rd Edition (Hamilton Conservation Authority 2014);
- Natural Areas Inventory 2006-2009 Volume 1 (Niagara Peninsula Conservation Authority 2010);

- Airport Employment Growth District (AEGD) Subwatershed Study (Dillon Consulting Ltd. and Aquafor Beech Ltd. 2011);
- AEGD Subwatershed Study Implementation Document (Aquafor Beech Ltd. 2017);
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC) Species at risk public registry (Government of Canada 2019);
- Significant Wildlife Habitat Technical Guide (SWHTG) (OMNR 2000, MNRF 2015a);
- Fisheries and Oceans Canada's aquatic species at risk mapping (DFO 2019);
- Ontario Breeding Bird Atlas (OBBA) (Bird Studies Canada et al. 2006);
- Ontario Reptile and Amphibian Atlas (ORAA) (Ontario Nature 2019);
- Atlas of the Mammals of Ontario (Dobbyn 1994);
- Ontario Butterfly Atlas (Macnaughton et al. 2019);
- Ontario Odonata Atlas (OOAD 2019); and
- Draft Natural Features and Headwater Characterization report (NRSI 2013) and associated Addendum (NRSI 2014).

For the purposes of this report, Species at Risk (SAR) are defined as species listed as provincially Threatened or Endangered that are afforded protection under the *Endangered Species Act* (ESA).

Within Ontario, Species of Conservation Concern (SCC) refer to:

- 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;
- 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.

Habitat for SCC is considered Significant Wildlife Habitat (SWH), which is afforded protection under the Provincial Policy Statement (OMMAH 2014) and the County and Municipal Official Plans.

In addition to the above-listed sources, background information request letters were sent to the NPCA and the Ministry of Natural Resources and Forestry (MNRF) Guelph District to request information on SAR, SCC, and SWH, as well as other relevant data. The request to MNRF was made prior to the transfer of regulatory mandate for the ESA to the Ministry of Environment, Conservation and Parks (MECP) in April 2019. A request was also made to the City of Hamilton for Linkage mapping files, since the mapping provided in the Official Plans is very coarse and more details were needed to properly assess the Linkages in the subject site. The Community Planning – GIS Section department provided these files to NRSI in 2018. The Hamilton Natural Areas Database, administered by the Hamilton Conservation Authority, was also queried (L. McDonell, *pers. comm*.) and the results were included in the background review process.

Significant Species and Significant Wildlife Habitat Desktop Assessments

Desktop habitat assessments for SAR, SCC, and SWH were completed to scope the work plan outlined in this TOR. As indicated by City Natural Heritage Planning staff, the provision of these screening results is not required at the TOR stage, but will need to be included in the EIS. Numerous SAR and SCC are reported from the study area; several of these species are considered to have, or potentially have, suitable habitat in the study area based on background information. Several candidate SWH types have also been identified in the study area based on discrete criteria provided by the MNRF (MNRF 2015a). The field program outlined in this TOR was carefully designed to ensure the collection of relevant, comprehensive data that can be used to determine the presence of these significant species and habitats.

Field Program

As detailed in Table 1 (Terrestrial Field Program) and Table 2 (Aquatic Field Program), NRSI has been completing field studies since 2018 as part of a large-scale field program that assessed all lands in the UWS block that were participating in the UWSLG at the time. Field work is ongoing in 2020. The field program outlined in this TOR incorporated comments received on the Garth Street Industrial Subdivision Draft Plan TOR (1st and 2nd submissions) received from the City and NPCA to ensure consistency across all field surveys.

Table 1 and 2 provide a comprehensive summary of all terrestrial and aquatic surveys proposed and undertaken in the study area to date, additional surveys that will be completed during the 2020 field season, and the protocols for each survey type. In the absence of a specific agency-authored protocol for conducting certain types of surveys, professional experience and judgement were and will be used by NRSI staff. A description of the general methodology for these surveys is provided.

Table 1. Terrestrial Field Program

Survey Type and Status	Timing and Survey Notes	Protocol	Completed Surveys (2018 – May 2020)	Scheduled Surveys (June-December 2020)
Vegetation				
Ecological Land Classification (ELC)	1 survey	Ecological Land Classification for Southern Ontario: A First Approximation and its Application (Lee et. al. 1998)	*East Blocks (A+B) and Central Block:* June 10, 2019	*West Block:* 1 survey
3-season vascular flora inventories	3 surveys: • Spring (May to early June) • Summer (July to August) • Fall (September to October) A comprehensive area search of all ELC vegetation community units to record all vascular plant species observed. The ELC code for each community has been, or will be verified during inventories to make any necessary updates.	n/a- professional experience and judgement were and will be used by NRSI staff in carrying out the surveys described in the column to the left.	n/a	*All Blocks:* 3 vascular flora inventories, 1 each in spring, summer and fall
Natural Feature Boundary Delineation	Significant Woodland Boundary Delineation and Agency Review	As per City of Hamilton EIS Guidelines Appendix 1 (March 2015), the Significant Woodland Boundary will be delineated based on the dripline, which is considered the area immediately below the outer circumference of each tree crown that is located along the edge of the wooded feature being assessed.	n/a	*East Blocks (A+B) and Central Block:* There are no Significant Woodlands in these UBE Blocks *West Block:* 1 survey, 1 agency review (for the Significant Woodland overlapping with the southwest corner of the Block)

Survey Type and Status	Timing and Survey Notes	Protocol	Completed Surveys (2018 – May 2020)	Scheduled Surveys (June-December 2020)
	Wetland Boundary Delineation Flagging	Ontario Wetland Evaluation System (OWES) (MNRF 2014a) and City of Hamilton EIS Guidelines Appendix 1 (March 2015)	*East Blocks (A+B) and Central Block:* July 30, 2019 August 6, 2019	*West Block:* 1 survey, 1 agency review
	Wetland Boundary Delineation Agency Review Attendees: *NRSI* – K. Richter, J. Pickering, M. Heyming *City* – M. Kiddie *NPCA* – L. Price		*East Blocks (A+B) and Central Block:* August 8, 2019	
Tree Inventory	Assessment of all trees >10cm DBH by NRSI Certified Arborists. Information collected included: • Tag number (where applicable) • Species (common and scientific name) • DBH measurement (cm) • Crown radius (m) • General health (good, fair, poor, dead) • Potential for structural failure (improbable, possible, probable, imminent) • Tree location (e.g. subject site) • General comments (i.e. disease, aesthetic quality, development constraints)	City of Hamilton's Tree Protection Guidelines (Appendix "A" to Report PD02229 (f) (City of Hamilton 2010)	*East Blocks (A+B) and Central Block:* August 6, 9, 13, 16, 19, and 20, 2019 September 11, 17, 19, 2019	*West Block* Ongoing until completion.

Survey Type and Status	Timing and Survey Notes	Protocol	Completed Surveys (2018 – May 2020)	Scheduled Surveys (June-December 2020)
Butternut Health Assessments and Genetic Testing	2 surveys between May 15 and August 31 During 2018-2019 field surveys, numerous Butternuts were found in the study area. To scope the amount of effort required, samples were taken from a subset of the on-site Butternuts and sent for genetic testing in 2019. The selected trees are likely to be parent trees to other smaller individuals in the surrounding area. Further testing may be required at a later stage. The amount of testing will be discussed with MECP and health assessments will be performed for all genetically pure individuals by one of NRSI's Certified Butternut Health Assessors. The results of the genetic tests will be included in the EIS, along with records of correspondence with the MECP.	Butternut Assessment Guidelines: Assessment of Butternut Tree Health for the Purposes of the *Endangered Species Act, 2007* (MNRF 2014b)	*East Blocks (A+B) and Central Block:* August 13, 14, 22, and 28, 2019	*All Blocks:* Ongoing until completion in the May 15-August 31 leaf-on period
Birds				
Breeding Bird Surveys	2 surveys Conducted 10 days apart between May 24 and July 10 • 1st survey between May 24 and June 15 • 2nd survey between June 16 and July 10	Ontario Breeding Bird Atlas Guide for Participants (OBBA 2001)	*East Blocks (A+B) and Central Block:* June 4, 2018 June 28, 2018	*West Block:* 2 surveys
Marsh Breeding Bird Surveys	2 surveys Conducted 10 days apart between May 20 and July 5	Marsh Monitoring Program Participant's Handbook for Surveying Marsh Birds (Bird Studies Canada 2009a)	n/a	*All Blocks:* 2 surveys

Survey Type and Status	Timing and Survey Notes	Protocol	Completed Surveys (2018 – May 2020)		Scheduled Surveys (June-December 2020)
Amphibians					
Anuran Call Surveys	3 surveys: • April between the 15th and 30th, when air temperature is >5°C • May between the 15th and 30th, when air temperature is >10°C • June between the 15th and 30th, when air temperature is >17°C	Marsh Monitoring Program Participant's Handbook for Surveying Amphibians (Bird Studies Canada 2009b)	**Date**	**Air Temp. (°C)**	*West Block:* May and June surveys.
			East Blocks (A+B) and Central Block:		
			April 24, 2018	10.5	
			May 28, 2018	23	
			June 20, 2018	18	
			West Block:		
			April 27, 2020	8	
Snakes					
Artificial Cover Object (ACO) Surveys	4' x 4' wooden boards with the upper surface painted black have been placed throughout suitable snake habitat in the study area, including at potential hibernacula sites. Based on the MNRF 2016 protocol, a minimum of 5 checks should occur before July 1st, and a minimum of 10 checks should occur during the active season (April to October).	Survey Protocol for Ontario's Species at Risk Snakes (MNRF 2016)	*East Blocks (A+B) and Central Block:* May 6, 2020 May 12, 2020 May 13, 2020 *West Block:* April 27, 2020 May 6, 2020 May 12, 2020 May 13, 2020		*All Blocks:* Remaining checks, up to 10 within the active season for snakes.
Species at Risk Bats					
Surveys for Habitat of Little Brown Myotis and Northern Myotis	1 survey during leaf-off conditions: Assess all isolated trees and trees in hedgerows for the presence of cavities or	Survey Protocol for Species at Risk Bats in Treed Habitats: Little Brown	*East Blocks (A+B) and Central Block:* May 7, 2018		*West Block:* 1 survey between November and December 2020

Survey Type and Status	Timing and Survey Notes	Protocol	Completed Surveys (2018 – May 2020)	Scheduled Surveys (June-December 2020)
	other features (e.g. loose bark, hollows) that may provide suitable roosting habitat for SAR bats. Determination of the use of candidate roost trees (through acoustic monitoring and exit surveys) will occur at a future development stage and is not included in this proposed scope of work. Consultation with the MECP will determine the monitoring approach. The MECP may also require acoustic monitoring and exit surveys prior to the demolition of residences and outbuildings on site that have the potential to house bat maternity colonies.	Myotis, Northern Myotis & Tri-Colored Bat (MNRF 2017)		
Surveys for Habitat of Tri-Colored Bat	During Tree Inventory surveys, all oak and maple trees ≥10cm DBH will be identified for further assessment as candidate habitat for Tri-colored Bat. Determination of the use of candidate roost trees (through acoustic monitoring and exit surveys) will occur at a future development stage and is not included in this proposed scope of work. Acoustic monitoring is to be carried out in the same year as any tree removal is proposed, since the tendency of trees to form suitable leaf clusters varies yearly. Consultation with the MECP will determine the monitoring approach.	Survey Protocol for Species at Risk Bats in Treed Habitats: Little Brown Myotis, Northern Myotis & Tri-Colored Bat (MNRF 2017)	*East Blocks (A+B) and Central Block:* Initiated on August 6, 2019, continuing until September 19, 2019 (conducted simultaneously with Tree Inventory)	*West Block:* 1 survey conducted simultaneously with Tree Inventory
Insects				
Insect Surveys Targeting Butterflies, Dragonflies, and Damselflies	3 surveys: • Late May/June • Mid-July	n/a- professional experience and judgement were used by NRSI staff in carrying out the surveys described in the column to the left.	*East Blocks (A+B) and Central Block:* July 16, 2019 August 16, 2019	*All Blocks:* 1 survey in June *West Block:*

Survey Type and Status	Timing and Survey Notes	Protocol	Completed Surveys (2018 – May 2020)	Scheduled Surveys (June-December 2020)
	• Mid-August Systematic area searches were or will be conducted between 08:00 and 14:00 by walking through all vegetation communities to capture the full range and diversity of habitat types. Each species was or will be captured if possible, identified, and information on behaviour recorded. Surveys were or will be conducted on sunny or partly-cloudy days when temperatures are 19°C or greater. Surveys will not occur if it is raining.			1 survey in July 1 survey in August
Ecological Linkage Assessment[1]				
Winter Wildlife Movement Surveys	2 surveys: • Within 24-48h of a fresh snow fall when snow depth is >10cm on average The subject site was and will be surveyed for wildlife tracks, travel corridors, and other evidence of use by wildlife, and mammal species in particular. Upon encountering tracks, the direction of movement, number of individuals, species, and behaviour was and will be recorded where possible. Observations were or will be mapped to identify wildlife movement patterns at a site-level scale. Surveys focussed or will focus on areas mapped as Linkages on UHOP Schedule B and on the approved AEGD Secondary Plan Natural Heritage System Map B.8-2,	n/a- professional experience and judgement were used by NRSI staff in carrying out the surveys described in the column to the left.	*East Blocks (A+B) and Central Block:* March 3, 2018 March 1, 2020 *West Block:* February 11, 2020 March 1, 2020	n/a

Survey Type and Status	Timing and Survey Notes	Protocol	Completed Surveys (2018 – May 2020)	Scheduled Surveys (June-December 2020)
	and will address policies in Volume 1 – C.2.7.6 and F.3.2.1.11 of the UHOP.			
Significant Wildlife Habitat Assessment				
SWH Surveys	Conducted for the purpose of identifying candidate SWH based on the desktop assessment. Surveys have and will include ongoing observations collected during all field surveys, following an initial site visit to identify areas of the subject site where candidate SWH may be located. Species or feature-specific surveys targeting candidate SWH are included in the field program outlined in this table and include: • Marsh Breeding Bird Surveys • Amphibian Call Surveys • Snake ACO and Emergence Surveys • Insect Surveys All proposed or completed wildlife surveys will determine the presence of various SCC species and their habitats (habitat for SCC is considered SWH). Ongoing assessment of SWH in the study area will occur during all field surveys to ensure a comprehensive analysis of all candidate SWH.	Significant Wildlife Habitat Technical Guide (OMNR 2000) and the Ecoregion Criteria Schedule for Ecoregion 7E (MNRF 2015).	*All Blocks:* Initial Survey- April 11, 2018 Subsequent Surveys: ongoing during field work scheduled through to May 2020	*All Blocks:* Ongoing during all field work scheduled between June and December 2020

[1]In addition to Winter Wildlife Surveys, NRSI biologists will continue to assess the ecological linkage function of the mapped and candidate Linkages during all field surveys by recording incidental observations of wildlife and wildlife sign. Areas where wildlife appear to congregate and travel will be mapped to gain an understanding of how wildlife occupy and move through the site year-round. Field surveys completed between 2018 – 2019 have included these observations, and data will continue to be collected throughout the 2020 field season.

Table 2. Aquatic Field Program

Survey Type and Status	Timing and Survey Notes	Protocol	Completed Surveys (2018 – May 2020)	Scheduled Surveys (2020)
Headwater Drainage Features				
HDF Assessments	3 surveys: • Early spring, in the period closely following the spring freshet and after frost has left the ground (typically, late March to early April • Late spring, conducted after the melt/thaw-related interflow has ceased (typically, late May) and prior to full vegetation "leaf-out" (i.e. prior to reaching a height of approximately 5cm) so that vegetation growth does not impact findings • Summer, conducted during dry periods to observe areas of permanent flow (typically July or August) It is preferable that the late spring and summer surveys are conducted following at least 3 days without precipitation. Field work was completed by NRSI biologists in cooperation with staff of GEO Morphix Limited, the fluvial geomorphology consultant on the project team.	Evaluation, Classification and Management of Headwater Drainage Feature Guidelines (CVC and TRCA 2014) Ontario Stream Assessment Protocol (OSAP) Section 4: Module 11 Unconstrained Headwater Sampling (Gorenc and Stanfield 2017)[1]	*East Blocks (A+B) and Central Block:* *2019 Surveys-* April 3, 2019 June 8, 2019 August 15, 2019 *All Blocks:* *2020 Surveys-* April 2, 2020 Note: since 2019 was an uncharacteristically wet year, re-assessments are being done in 2020 to confirm that the management recommendations based on 2019 data are accurate	*All Blocks:* Late spring and summer surveys
Aquatic Surveys				
Aquatic Habitat Assessments	1 survey: • Summer (between June and early September), during low flow / baseflow conditions	Modified version of the Ontario Stream Assessment Protocol (OSAP) Version 9.0 (Stanfield 2013)	*East (A+B) and Central Blocks:* August 15, 2019	*All Blocks:* 1 survey in May or June

Survey Type and Status	Timing and Survey Notes	Protocol	Completed Surveys (2018 – May 2020)	Scheduled Surveys (2020)
	NRSI biologists surveyed all HDFs in the study area. Riparian zone conditions, surrounding land use, bank stability, aquatic vegetation cover, in-stream habitat features, and water temperature were recorded. Information on the condition and connectivity of all features as well as barriers to fish passage in and adjacent to the study area (where possible) were also recorded. Any candidate habitat for significant fish species was described and mapped.			
Fish Community Sampling	1 survey: • Between May and June Backpack electrofishing methods will be used to determine the fish community composition in the HDFs in the study area. Notes on the quality and character of aquatic habitat at sampling stations will be recorded.	Modified version of the Ontario Stream Assessment Protocol (OSAP) Version 9.0 (Stanfield 2013)	n/a	*All Blocks:* 1 survey in May or June

[1] NRSI biologists and GEO Morphix Limited staff that conducted HDF Assessments are certified in the application of this OSAP module.
[2] Due to the particularly wet spring and delay in vegetation leaf-out in 2019, the second HDF survey for the East and Central Blocks was conducted in early June rather than late May so that surveys could be completed after 3 days of limited to no precipitation. Vegetation growth did not exceed 5cm in height during this survey and therefore did not impact survey findings.

Environmental Impact Statement Reporting and Analyses

An EIS report will be prepared in accordance with the City's Environmental Impact Statement (EIS) Guidelines (March 2015). The following paragraphs describe some of the sections that are anticipated to form the EIS report. For a full list of all proposed EIS content, a preliminary Table of Contents is provided in Appendix I.

Existing Conditions

The results of the field program detailed in Table 1 and 2 will be summarized in the EIS. Relevant details of other reports prepared by the project team (e.g. Geotechnical and Hydrogeological Investigations, Fluvial Geomorphology Assessment) will also be incorporated into the description of the existing conditions on the subject site. Report sections and associated appendices specific to each vegetation and wildlife group will include the national, provincial, and local rankings of each species observed on site or reported from the study area. The local status will be based on the information provided in the Hamilton Natural Areas Inventory Project 3rd Edition Species Checklist (2015), or newer if available. The discussion of wildlife survey results will include information about the location, abundance, and life history of each significant species observed (e.g. SAR, SCC, and locally significant species).

Headwater Drainage Feature Assessment

Several headwater tributaries of Twenty Mile Creek overlap with the study area, flowing east to join the main stem of Twenty Mile Creek. As important eco-hydrological features, a fulsome assessment of the flow, form, and function of the HDFs on site is required to determine an appropriate management approach. As detailed in Table 2, these HDFs were comprehensively surveyed in 2019. The HDF Assessment will be detailed under the Aquatic Habitat Section of the EIS and will be prepared in accordance with the Evaluation, Classification and Management of Headwater Drainage Feature Guidelines (January 2014) authored by Credit Valley Conservation (CVC) and Toronto and Region Conservation Authority (TRCA) (referred to as the "Headwater Guidelines"). The results of the HDF field surveys will be used to classify each HDF reach on site and to determine management recommendations. The field work and the HDF Assessment will be completed in cooperation with GEO Morphix Limited, the fluvial geomorphology consultant on the project team.

As per the Headwater Guidelines, classification will consider the influence of modifiers and professional judgement to determine the appropriate classification, where applicable. The results of this process will be clearly articulated in a table in the EIS that summarizes the final management recommendations for each HDF.

Linkage Assessment

As detailed in Table 1, winter wildlife movement surveys were initiated in 2018, and will continue in 2020, to identify wildlife tracks and movement patterns through the subject site and mapped Linkages. These Linkages were, and will continue to be, assessed during all field surveys (Table 1). Site investigations will examine evidence of wildlife usage, connectivity, linkage boundaries, condition, integrity, vegetation, landscape features, and overall function. The boundaries of the linkages will be identified using ELC mapping. The purpose of the LA is to address policies in the UHOP Volume 1 – C.2.7.6 and F.3.2.1.11 and will:

- Assess the ecological features and functions of each mapped Linkage in the subject site, including its vegetation, wildlife usage, and landscape level functions;
- Identify Linkage boundaries based on these features and functions;

- Describe the ecological function, condition, and integrity of Linkages; and
- Identify how ecological function will be maintained or enhanced under the post-development condition.

The LA will be integrated into the EIS report, with separate discussions specific to Linkages under appropriate headings (e.g. Policies, Impacts, Mitigation Measure, Recommendations, etc.). The LA will be prepared in accordance with the City's Linkage Assessment Guidelines (March 2015) and will include the following information:

- A description of the development proposal,
- Relevant policies, legislation, and planning studies, and a discussion on how the proposed undertaking addresses these policies,
- Characterization and assessment of the ecological function of the Linkages and surrounding areas (including discussion of the condition, viability, and integrity of the Linkage)
- Mapping that illustrates the boundaries of the Linkages,
- Assessment of the significance of environmental features and habitats
- An impacts analysis (including direct, indirect, induced, and cumulative impacts, as well as short and long-term impacts), which will include the Linkages, and
- Recommendations for mitigation measures and monitoring for the Linkages.

Since the LA will be integrated into the EIS report, a discussion of the Linkage-specific policies will be provided in the Policy Context section. In addition, impacts and mitigation measures associated with the Linkage areas will be discussed in those respective sections of the report.

Impact Analysis

The details of the proposed undertaking will be reviewed and compared to the existing conditions in the study area. NRSI will continue to work with the project team throughout the process to inform the layout of blocks, roads and services to avoid direct impacts to the natural features. Any areas of conflict between significant natural features, vegetation protection zones (VPZs), and the proposed undertaking that cannot be avoided will be discussed with the project team and options for reducing or mitigating impacts will be recommended. Mitigation measures will be discussed in a separate section of the report. Since the UBE application submission will be less detailed than a Draft Plan application, impacts will be assessed at a high level, and to the extent possible with the information provided by the project team. Impacts will be determined based on the direct, indirect, induced, and cumulative effects of the undertaking, described as follows:

<u>Direct Impacts:</u>

The approach to identifying and delineating constraint areas, discussed above, will be used to avoid direct impacts from the development to important natural features. The delineation of natural features and associated VPZs, and other applicable development setbacks will be provided to the study team to guide the proposed development layout. Any direct impacts that cannot be avoided will be discussed in this section of the EIS.

Indirect Impacts:

Indirect impacts are those associated with changes in site conditions such as drainage and water quantity/quality. Details of the stormwater management design and site layout will not be included with the UBE application; rather, this information will be provided at the Draft Plan application stage. As such, NRSI anticipates that a high-level indirect impact assessment can be completed for the EIS based on the conceptual SWM plans provided by the project team.

Induced and Cumulative Impacts:

Induced impacts are those that are not directly related to the construction of the undertaking, but rather arise from the human use of natural areas due to the development. Cumulative impacts look at the character and potential changes that are occurring or may occur in the future on surrounding lands. Cumulative impacts include spatial and temporal crowding, and spatial and temporal lags.

Mitigation Measures

The implications of development in or adjacent to natural features based on applicable regulations and policies will be identified and discussed. An analysis of the appropriate VPZs from the natural features in the subject site and adjacent areas will be included in the report. Where it has been determined that potential negative impacts to environmental features or Linkages are unavoidable, a discussion of appropriate mitigation measures (e.g. construction timing windows, development limit fencing, tree protection measures, stormwater management strategies) and/or recommended compensation will be provided. Recommendations for naturalized plantings or VPZ enhancements will be presented as part of Draft Plan applications. The significance of any residual impacts, following the application of mitigation measures, will be discussed in this section.

Recommendations

The EIS report will include recommendations that highlight additional studies or areas of focus for the Draft Plan application, including high-level monitoring recommendations. As the goal is to bring the UBE Blocks into the urban boundary, recommendations provided as part of the AEGD Subwatershed Study will be considered and included, where possible.

Tree Protection Plan

As part of the requirements for an UBE application, NRSI will prepare a TPP for the study area. NRSI's Certified Arborists are conducting a tree inventory and will prepare a TPP in accordance with the City's Tree Protection Guidelines (2010), City of Hamilton Tree By-law No. 06-151, and the City's Urban Woodland Conservation By-law 14-212. The objective of this study is to identify opportunities for the preservation and protection of existing trees, identify and summarize tree health, and present high-level compensation recommendations where tree removal cannot be avoided. A preliminary assessment for the preservation and removal analysis will be provided in the TPP based on existing plans provided by the project team. Once further site layout details are known at the Draft Plan stage, a detailed analysis, with specific rationale provided for tree removals, will be prepared and submitted to the City. NRSI will describe and summarize all trees inventoried on site, identify trees to be removed, retained, or potentially relocated based on the extent of the development, and overall health and potential for structural failure.

The inventories will include identifying the location of all trees greater than 10cm diameter at breast height (DBH) (using a Trimble backpack GPS unit, or similar), an assessment of each

tree (by recording the information for each tree as detailed in Table 1) and installation of an aluminum tree tag with an identification number.

A map (or series of maps) will be provided that shows each inventoried tree, other general site conditions (e.g. topography), and an overlay of the community framework plan. Trees that will be retained and protected, and those requiring removal will be identified, based on high-level information available for the UBE application. Opportunities for tree retention will also be provided. To ensure existing tree cover is maintained, the City requires 1:1 compensation for all trees ≥10cm DBH that are proposed for removal. The TPP will be appended to the EIS and will include a tree inventory chart, maps, and analysis as identified in the City's Tree Protection Guidelines. The results of the tree inventory and TPP will also be summarized in the EIS.

This TOR provides a comprehensive description of the proposed EIS, LA, and TPP for the UBE application. NRSI has considered all comments received to date on TOR and application submissions for adjacent lands in the preparation of this TOR. The goal is to provide a consistent product throughout the UWS Block, for all submissions. Should you have any questions, or further comments, please do not hesitate to contact the undersigned.

Sincerely,
Natural Resource Solutions Inc.

Desta Frey,
Project Coordinator
Aquatic & Terrestrial Biologist

Cc.: Nick Wood, Corbett Land Strategies

Candice Hood, Corbett Land Strategies

Ryan Archer, Natural Resource Solutions Inc.

Dave Deluce, Niagara Peninsula Conservation Authority

Lisa Price, Niagara Peninsula Conservation Authority

Encl.: Map 1 – Study Area

Appendix I – Draft EIS Table of Contents

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Denyes, David. May 8, 2018. Management Biologist, Ministry of Natural Resources and Forestry- Guelph District, letter correspondence.

McDonell, Lesley. June 4, 2018. Terrestrial Ecologist, Hamilton Conservation Authority, email correspondence.

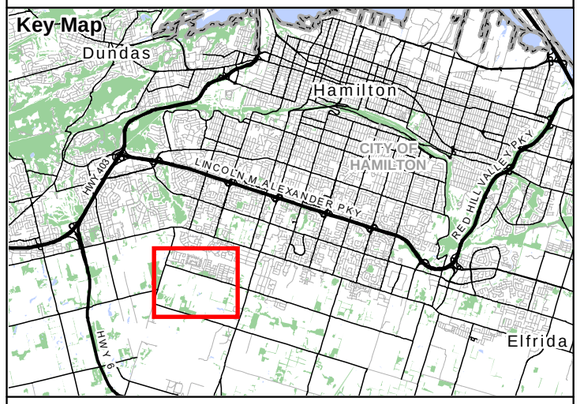
MAP 1

Study Area

Map 1

Upper West Side Urban Boundary Expansion

Study Area and Environmental Constraints



Legend

- Subject Site
- Study Area
- Provincially Significant Wetland (PSW)
- PSW Buffer (30m)
- Other Wetlands
- Other Wetlands Buffer (15m)
- Woodlot
- Woodlot Buffer (10m)
- Significant Woodlands (Aquafor Beech 2017)
- Significant Woodlot Buffer (30m)
- Permanent Watercourse
- Intermittent Watercourse
- Watercourse Buffer (15m)
- Water Body

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1974E
Date: May 12, 2020

NAD83 - UTM Zone 17
Size: 11x17"
1:9,000

0 100 200 300 400 500 Metres

N

Path: X:\1405_TwentyRdLandownersGroupAssessments\NRSI_1974E_Map1_UBE_CE_StudyArea_9K_2020_05_12_KEF.mxd

APPENDIX I

Draft EIS Table of Contents

Upper West Side: Urban Boundary Expansion

Environmental Impact Statement & Linkage Assessment

Draft Table of Contents

Subject: Re: Terms of Reference- Upper West Side Urban Boundary Expansion (proj1974E)
From: "Kiddie, Melissa" <Melissa.Kiddie@hamilton.ca>
Date: 2020-06-02, 8:42 a.m.
To: Desta Frey <dfrey@nrsi.on.ca>, Sarah Mastroianni NPCA <smastroianni@npca.ca>
CC: Ryan Archer <rarcher@nrsi.on.ca>, Nick Wood <nick@corbettlandstrategies.ca>, Candice Hood Corbett Land Strategies <candice@corbettlandstrategies.ca>, David Deluce NPCA <ddeluce@npca.ca>, "Lisa Price" <lprice@npca.ca>

Hi Desta/Ryan,

Thank you for providing the Terms of Reference (ToR) for the Upper West Side Urban Boundary Expansion. I have now had a chance to review and provide my comments below. Based on these comments, the ToR has not been approved at this time. Further clarifications/revisions are required.

1. On page 1 of the ToR, it has been identified that East Block “A” is comprised of 9825 and 9445 Twenty Road while East Block “B” is comprised of 9511 Twenty Road. This does not match Map 1 (page 22). This map suggests that East Block “A” is comprised of 9511 Twenty Road and 9445 Twenty Road while East Block “B” is comprised of 9285 Twenty Road. Further clarification is required.

2. It is important to note that field work supporting Environmental Impact Statements (EIS) is valid for 5 years. After 5 years, it needs to be updated to reflect current conditions. While the field work has been completed in 2018, 2019 and 2020, this is important to consider in terms of timing of submissions.

3. Background Review: On page 4, it has been identified that a draft Natural Features and Headwater Characterization Report and Addendum prepared by Natural Resource Solutions Inc. (2013; 2014) will be reviewed. There is concern that this information has not undergone agency review. This information should be provided as an appendix in the report.

4. Field Work:

a) Natural Feature Boundary Delineation:
i. Significant Woodland: It has been identified that the Significant Woodland overlapping the West Block will be surveyed. Is there a timeframe for this survey? Further clarification is required.
ii. Wetland: It has been identified that the wetland boundary within the West Block will be surveyed. Is there a timeframe for this survey?
b) Tree Inventory: It has been identified that the tree inventory will occur within the West block until completion. Is there a proposed timeline? Further clarification is required.
c) Butternut Health Assessment: It is important to provide all Butternut Health Assessments, genetic testing and correspondence from the Ministry of Environment, Conservation and Parks (MECP) within the EIS.
d) Bats: Inventories for habitat for Little Brown Myotis and Northern Myotis have been identified to be completed in leaf-off conditions. The timing of these needs to be clearly identified.

In addition, within the February 2020 EIS it was identified that the bat assessment was completed during leaf-off conditions as per the City’s Tree Protection Guidelines. It is important to

note that this survey is not identified within these Guidelines.

e) Snakes: It has been identified that cover board surveys are to be undertaken within 2020. Generally, cover boards do not provide representative results if they are only sampled one year (need to be in place for at least 2 years). Further clarification is required.

f) Terrestrial Crayfish: Within the February 2020 EIS, it was identified that terrestrial crayfish were identified as Significant Wildlife Habitat; however surveys were missing. Further clarification is required.

g) Winter Wildlife Surveys: Within the February 2020 EIS it was identified that winter wildlife surveys were completed as per the City's Linkage Assessment Guidelines. It is important to note that these surveys are not specifically outlined within these Guidelines.

h) Headwater Drainage Features (HDF): Watercourses within the area are regulated by the Niagara Peninsula Conservation Authority (NPCA). Site visits with NPCA need to occur to determine if these watercourses meet the definition of a HDF or regulated watercourse. This is missing from the ToR. If these features are deemed to be watercourses, aquatic habitat characterization not related to HDF methodology is required. It is important to consider that these watercourses provide connections to the Upper Twenty Mile Creek Provincially Significant Wetland (PSW) located on adjacent properties.

i) Aquatic Habitat Assessment: It has been identified that aquatic habitat assessment for the West block will be between May and June. Why is this not being completed during the same time frame (August) as the other blocks? Further clarification is required.

j) Significant Wildlife Habitat (SWH) Screening: On page 4, it has been noted that Species of Conservation Concern are considered as SWH under the Provincial Policy Statement, County and municipal plans. It is important to note that Hamilton is a single tier municipality (there is no County) and that SWH (or Species at Risk) has not been mapped on schedules within the Rural Hamilton Official Plan (RHOP) or Urban Hamilton Official Plan (UHOP).

In addition, on page 5, it has been identified that a desktop screening of SWH has occurred. While this screening does not need to be included within the TOR, the screening is to be completed using the Ministry of Natural Resources and Forestry (MNRF) SWH Criteria Table for 7E. This needs to be referenced within the ToR.

5. Report:

a) Linkage Assessment: The Urban Boundary Expansion conceptual block plan incorporates the Natural Heritage System. Within the February 2020 EIS, Linkages were not identified within the Natural Heritage System and impacts to Linkages on adjacent properties were not considered. This needs to be discussed within the report.

b) Proposed Development:

i. On page 2, it has been identified that the proposed development will consist of a road network, compact residential development and portions of a connected and continuous Natural Heritage System. There is concern that a development concept has not been provided. This will need to be included within the EIS.

ii. Integration with the Airport Employment Growth District (AEGD) Secondary Plan: It is unclear at this time, if the lands within the proposed boundary expansion will become part of the AEGD Secondary Plan. It is important that the integration with this Secondary Plan is

discussed. In addition, it is unclear how this will integrate with the proposed development at 9511 Twenty Road.

iii. It is important to discuss the non-ecological components such as stormwater management and low impact development features.

c) Impact Analysis:

i. It has been identified that direct impacts to important natural features will be considered. It is unclear what "important natural features" are. Further clarification is required.

ii. It has been identified that details of the stormwater management and site layout will not be provided. Since the EIS is being prepared as part of a larger Subwatershed Study analysis, it is important to provide high level discussions of stormwater management and layout.

d) Table of Contents: A draft Table of Contents has been provided. There are concerns with the following elements:

i. Section 2.0 Policy Context

- PPS 2014 has been identified to be reviewed. A new PPS (2020) has been in force since May 1, 2020 and is to be reviewed.
- The Rural Hamilton Official Plan (RHOP) and the Urban Hamilton Official Plan (UHOP) have been identified within the same section (2.6). These documents should be separated. In addition, the surrounding urban area is within the Airport Employment Growth District (AEGD) Secondary Plan. This should be included within the discussion.
- Section 2.8 indicates "additional background information". This should be removed and included within Section 1.1 (Background Information).

ii. Section 4.2 (Designated Natural Areas): It is unclear what will be discussed within this section. Further clarification is required. It is important that the boundaries/dates of all surveyed features (i.e. wetlands) be included on all figures.

iii. Section 4.5 (Aquatic Habitat): Discussions focus only on headwater drainage features. Discussions should also include areas that may not be regarded as headwater drainage features (i.e. watercourses regulated by NPCA).

iv. On the Conceptual Block Plan (Figure 6) within the February 2020 Central and East Blocks EIS and Linkage Assessment, a "Natural Open Space" area has been identified. The Table of Contents is missing a discussion on the development of the Natural Heritage System and this "Natural Open Space".

6. Tree Inventory:

i. It has been identified that the tree inventory will be prepared in accordance with the City's By-laws of 06-151 and 14-212. It is important to note that By-law 14-212 is only applicable within the urban area. Trees within woodlands (08.1 ha or greater) in the rural area are subject to By-law R00-054.

ii. Tree cutting may have already occurred on 555 Glancaster Road. Has the tree inventory captured those trees that were removed? Further clarification is required.

Thanks,

Melissa

Melissa Kiddie MES (PI), ERPG
Natural Heritage Planner
Development Planning, Heritage and Design (Suburban Team)
Planning and Economic Development
(905)546-2424 ext. 1290

The City of Hamilton encourages the physical distancing and increased handwashing. Learn more about the City's response to COVID-19 at www.hamilton.ca/coronavirus.

From: Desta Frey <dfrey@nrsi.on.ca>
Sent: Thursday, May 14, 2020 10:15 AM
To: Kiddie, Melissa; Sarah Mastroianni NPCA
Cc: Ryan Archer; Nick Wood; Candice Hood Corbett Land Strategies; David Deluce NPCA; Lisa Price
Subject: Terms of Reference- Upper West Side Urban Boundary Expansion (proj1974E)

Good morning Melissa and Sarah,

On behalf of the Upper West Side Landowners Group (UWSLG), Corbett Land Strategies (CLS), and Natural Resource Solutions Inc. (NRSI), I am pleased to submit a Terms of Reference (TOR) for an Environmental Impact Study (EIS), Linkage Assessment (LA), and Tree Protection Plan (TPP) for the Upper West Side Urban Boundary Expansion application. A formal pre-consultation application was made in early March 2020, and the attached TOR refers to the following lands and file numbers:
FC-20-028 - 9825, 9445, and 9511 Twenty Road West
FC-20-029 - 9751-9625 Twenty Road West
FC-20-034 - 555 Glancaster Road
The TOR is attached to this email for your review.

Thank you very much. We are looking forward to receiving the City's and the NPCA's comments.
Best regards,
Desta
--

Desta Frey M.Sc. P.Biol.
Terrestrial and Aquatic Biologist
Natural Resource Solutions Inc.
415 Phillip Street, Unit C
Waterloo, ON N2L 3X2
(p) 519-725-2227 Ext. 289 (f) 519-725-2575
(w) www.nrsi.on.ca (e) dfrey@nrsi.on.ca
@nrsinews

Subject: RE: Terms of Reference- Upper West Side Urban Boundary Expansion (proj1974E)
From: Sarah Mastroianni <smastroianni@npca.ca>
Date: 2020-06-05, 9:04 a.m.
To: "Kiddie, Melissa" <Melissa.Kiddie@hamilton.ca>, Desta Frey <dfrey@nrsi.on.ca>
CC: Ryan Archer <rarcher@nrsi.on.ca>, Nick Wood <nick@corbettlandstrategies.ca>, Candice Hood Corbett Land Strategies <candice@corbettlandstrategies.ca>, David Deluce <ddeluce@npca.ca>

Good Morning All,

The NPCA agrees with the comments provided previously by the City of Hamilton's Natural Heritage Planner (attached below). In addition to those comments, the NPCA offers the following:

1. As noted by Melissa Kiddie, there should be an NPCA site visit to determine which watercourse(s) constitute headwater drainage features and which are regulated channels, as the methods of assessments and level of protection and/or mitigation my be different. The TOR seem to imply that all are HWDF where some channels have headwaters that extend beyond the property limits defined by the Block diagram (study area) and should be assessed more comprehensively and in relation to associated features such as wetlands;

2. There is no mention of any hydrologic assessment that would determine the relative catchment areas or contribution zones that are feeding the channels or wetland areas. This needs to be added to ensure that the impacts associated with development address the hydrologic functions of the NPCA regulated features;

3. Buffers need to be clearly identified in the EIS mapping with written justification of any proposed reductions from the policy stated setbacks.

Please let me know if you have any questions.

Thank you.

Sarah Mastroianni
Senior Watershed Planner
Niagara Peninsula Conservation Authority
250 Thorold Road West, 3rd Floor
Welland, Ontario L3C 3W2
Phone: 905 788 3135 (ext. 249)
Fax: 905 788 1121
email: smastroianni@npca.ca

Thank you for your email. Due to the COVID-19 pandemic, the NPCA has taken measures to protect staff and public while providing continuity of services. NPCA enforcement, permitting and planning functions are continuing to operate, however there may be delays in receiving responses to inquiries or complaints due to staff restrictions and remote work locations. Updates with regards to NPCA operations and activities can be found on our website at www.npca.ca/our-voice, the NPCA Facebook page at https://www.facebook.com/NPCAOntario and on Twitter at https://twitter.com/NPCA_Ontario.

For more information on Permits, Planning and Forestry please go to the Permits & Planning webpage at https://npca.ca/administration/permits.

For mapping on features regulated by the NPCA please go to our GIS webpage at https://gis-npca-camaps.opendata.arcgis.com/ and utilize our Watershed Explorer App or GIS viewer.

To send NPCA staff information regarding a potential violation of Ontario Regulation 155/06 please go to the NPCA Enforcement and Compliance webpage at https://npca.ca/administration/enforcement-compliance.

NPCA Watershed Explorer

From: Kiddie, Melissa <Melissa.Kiddie@hamilton.ca>
Sent: Tuesday, June 2, 2020 8:42 AM
To: Desta Frey <dfrey@nrsi.on.ca>; Sarah Mastroianni <smastroianni@npca.ca>
Cc: Ryan Archer <rarcher@nrsi.on.ca>; Nick Wood <nick@corbettlandstrategies.ca>; Candice Hood Corbett Land Strategies <candice@corbettlandstrategies.ca>; David Deluce <ddeluce@npca.ca>; Lisa Price <lprice@npca.ca>
Subject: Re: Terms of Reference- Upper West Side Urban Boundary Expansion (proj1974E)

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ii. Wetland: It has been identified that the wetland boundary within the West Block will be surveyed. Is there a timeframe for this survey?

b) Tree Inventory: It has been identified that the tree inventory will occur within the West block until completion. Is there a proposed timeline? Further clarification is required.

c) Butternut Health Assessment: It is important to provide all Butternut Health Assessments, genetic testing and correspondence from the Ministry of Environment, Conservation and Parks (MECP) within the EIS.

d) Bats: Inventories for habitat for Little Brown Myotis and Northern Myotis have been identified to be completed in leaf-off conditions. The timing of these needs to be clearly identified.

In addition, within the February 2020 EIS it was identified that the bat assessment was completed during leaf-off conditions as per the City's Tree Protection Guidelines. It is important to note that this survey is not identified within these Guidelines.

e) Snakes: It has been identified that cover board surveys are to be undertaken within 2020. Generally, cover boards do not provide representative results if they are only sampled one year (need to be in place for at least 2 years). Further clarification is required.

f) Terrestrial Crayfish: Within the February 2020 EIS, it was identified that terrestrial crayfish were identified as Significant Wildlife Habitat; however surveys were missing. Further clarification is required.

g) Winter Wildlife Surveys: Within the February 2020 EIS it was identified that winter wildlife surveys were completed as per the City's Linkage Assessment Guidelines. It is important to note that these surveys are not specifically outlined within these Guidelines.

h) Headwater Drainage Features (HDF): Watercourses within the area are regulated by the Niagara Peninsula Conservation Authority (NPCA). Site visits with NPCA need to occur to determine if these watercourses meet the definition of a HDF or regulated watercourse. This is missing from the ToR. If these features are deemed to be watercourses, aquatic habitat characterization not related to HDF methodology is required. It is important to consider that these

watercourses provide connections to the Upper Twenty Mile Creek Provincially Significant Wetland (PSW) located on adjacent properties.

i) Aquatic Habitat Assessment: It has been identified that aquatic habitat assessment for the West block will be between May and June. Why is this not being completed during the same time frame (August) as the other blocks? Further clarification is required.

j) Significant Wildlife Habitat (SWH) Screening: On page 4, it has been noted that Species of Conservation Concern are considered as SWH under the Provincial Policy Statement, County and municipal plans. It is important to note that Hamilton is a single tier municipality (there is no County) and that SWH (or Species at Risk) has not been mapped on schedules within the Rural Hamilton Official Plan (RHOP) or Urban Hamilton Official Plan (UHOP).

In addition, on page 5, it has been identified that a desktop screening of SWH has occurred. While this screening does not need to be included within the TOR, the screening is to be completed using the Ministry of Natural Resources and Forestry (MNRF) SWH Criteria Table for 7E. This needs to be referenced within the ToR.

5. Report:

a) Linkage Assessment: The Urban Boundary Expansion conceptual block plan incorporates the Natural Heritage System. Within the February 2020 EIS, Linkages were not identified within the Natural Heritage System and impacts to Linkages on adjacent properties were not considered. This needs to be discussed within the report.

b) Proposed Development:

i. On page 2, it has been identified that the proposed development will consist of a road network, compact residential development and portions of a connected and continuous Natural Heritage System. There is concern that a development concept has not been provided. This will need to be included within the EIS.

ii. Integration with the Airport Employment Growth District (AEGD) Secondary Plan: It is unclear at this time, if the lands within the proposed boundary expansion will become part of the AEGD Secondary Plan. It is important that the integration with this Secondary Plan is discussed. In addition, it is unclear how this will integrate with the proposed development at 9511 Twenty Road.

iii. It is important to discuss the non-ecological components such as stormwater management and low impact development features.

c) Impact Analysis:

i. It has been identified that direct impacts to important natural features will be considered. It is unclear what "important natural features" are. Further clarification is required.

ii. It has been identified that details of the stormwater management and site layout will not be provided. Since the EIS is being prepared as part of a larger Subwatershed Study analysis, it is important to provide high level discussions of stormwater management and layout.

d) Table of Contents: A draft Table of Contents has been provided. There are concerns with the following elements:

i. Section 2.0 Policy Context

· PPS 2014 has been identified to be reviewed. A new PPS (2020) has been in force since May 1, 2020 and is to be reviewed.

· The Rural Hamilton Official Plan (RHOP) and the Urban Hamilton Official Plan (UHOP) have been identified within the same section (2.6). These documents should be separated. In addition, the surrounding urban area is within the Airport Employment Growth District (AEGD) Secondary Plan. This should be included within the discussion.

· Section 2.8 indicates "additional background information". This should be removed and included within Section 1.1 (Background Information).

ii. Section 4.2 (Designated Natural Areas): It is unclear what will be discussed within this section. Further clarification is required. It is important that the boundaries/dates of all surveyed features (i.e. wetlands) be included on all figures.

iii. Section 4.5 (Aquatic Habitat): Discussions focus only on headwater drainage features. Discussions should also include areas that may not be regarded as headwater drainage features (i.e. watercourses regulated by NPCA).

iv. On the Conceptual Block Plan (Figure 6) within the February 2020 Central and East Blocks EIS and Linkage Assessment, a "Natural Open Space" area has been identified. The Table of Contents is missing a discussion on the development of the Natural Heritage System and this "Natural Open Space".

6. Tree Inventory:

i. It has been identified that the tree inventory will be prepared in accordance with the City's By-laws of 06-151 and 14-212. It is important to note that By-law 14-212 is only applicable within the urban area. Trees within woodlands (08.1 ha or greater) in the rural area are subject to By-law R00-054.

ii. Tree cutting may have already occurred on 555 Glancaster Road. Has the tree inventory captured those trees that were removed? Further clarification is required.

Thanks,

Melissa

Melissa Kiddie MES (PI), ERPG
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Development Planning, Heritage and Design (Suburban Team)
Planning and Economic Development
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The City of Hamilton encourages the physical distancing and increased handwashing. Learn more about the City's response to COVID-19 at www.hamilton.ca/coronavirus.

From: Desta Frey <dfrey@nrsi.on.ca>
Sent: Thursday, May 14, 2020 10:15 AM
To: Kiddie, Melissa; Sarah Mastroianni NPCA
Cc: Ryan Archer; Nick Wood; Candice Hood Corbett Land Strategies; David Deluce NPCA; Lisa Price
Subject: Terms of Reference- Upper West Side Urban Boundary Expansion (proj1974E)

Good morning Melissa and Sarah,

On behalf of the Upper West Side Landowners Group (UWSLG), Corbett Land Strategies (CLS), and Natural Resource Solutions Inc. (NRSI), I am pleased to submit a Terms of Reference (TOR) for an Environmental Impact Study (EIS), Linkage Assessment (LA), and Tree Protection Plan (TPP) for the Upper West Side Urban Boundary Expansion application. A formal pre-consultation application was made in early March 2020, and the attached TOR refers to the following lands and file numbers:

FC-20-028 - 9825, 9445, and 9511 Twenty Road West

FC-20-029 - 9751-9625 Twenty Road West
FC-20-034 - 555 Glancaster Road

The TOR is attached to this email for your review.

Thank you very much. We are looking forward to receiving the City's and the NPCA's comments.

Best regards,

Desta

--

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Appendix II
Species at Risk and Species of Conservation Concern Screening

Species at Risk and Species of Conservation Concern Screening

Scientific Name	Common Name	S-RANK[1]	SARO[1]	COSEWIC[1,2]	SARA Status[2]	SARA Schedule[2]	Background Source	Habitat Preference[3,4,5,6,7]	East A and East B Blocks		Central Block		West Block	
									Suitable Habitat Present?	Rationale	Suitable Habitat Present?	Rationale	Suitable Habitat Present?	Rationale
Vascular Plants														
Arisaema dracontium	Green Dragon	S3	SC	SC	SC	Schedule 3	SAR in Hamilton Region (MNRF 2019c)	Grows in somewhat wet to wet deciduous forests along streams, particularly maple forest and forest dominated by Red Ash and White Elm trees.	No	Preferred habitat not present. Species not observed by NRSI biologists during vegetation inventories.	No	Preferred habitat not present. Species not observed by NRSI biologists during vegetation inventories.	No	Preferred habitat not present. Vegetation inventories will be completed in 2020.
Betula lenta	Cherry Birch	S1	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Moist, well-drained clay loam soil over limestone bedrock with White Oak, Red Oak, Eastern Hemlock, Sugar Maple and other deciduous trees.	No	Preferred habitat not present. Species not observed by NRSI biologists during vegetation inventories.	No	Preferred habitat not present. Species not observed by NRSI biologists during vegetation inventories.	No	Preferred habitat not present. Vegetation inventories will be completed in 2020.
Calidris canutus	Red Knot	S1N	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Open beaches, mudflats, and coastal lagoons, where they feast on molluscs, crustaceans, and other invertebrates. Also occur in small numbers during the fall in southern Ontario, along Great Lakes beaches and mudflats	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Breeding Bird surveys will be completed in 2020.
Castanea dentata	American Chestnut	S1S2	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Moist to well drained forests on sand, occasionally heavy soils.	No	Preferred habitat not present. Species not observed by NRSI biologists during vegetation inventories.	No	Preferred habitat not present. Species not observed by NRSI biologists during vegetation inventories.	No	Preferred habitat not present. Vegetation inventories will be completed in 2020.
Cornus florida	Eastern Flowering Dogwood	S2?	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Eastern Flowering Dogwood grows under taller trees in mid-age to mature deciduous or mixed forests. It most commonly grows on floodplains, slopes, bluffs and in ravines, and is also sometimes found along roadsides and fencerows.	No	Preferred habitat not present. Species not observed by NRSI biologists during vegetation inventories.	No	Preferred habitat not present. Species not observed by NRSI biologists during vegetation inventories.	No	Preferred habitat not present. Vegetation inventories will be completed in 2020.
Eurybia divaricata	White Wood Aster	S2S3	THR	T	T	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	White wood aster grows in open, dry deciduous forests that are dominated by Sugar maple and American beech trees. It is often found mixed in with other asters. The plant does best in well-drained soils and it may prefer a low level of disturbance, as it has been found to grow along trails. It does well in partial to full shade.	No	Preferred habitat not present. Species not observed by NRSI biologists during vegetation inventories.	No	Preferred habitat not present. Species not observed by NRSI biologists during vegetation inventories.	No	Preferred habitat not present. Vegetation inventories will be completed in 2020.
Frasera caroliniensis	American Columbo	S2	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Woodlands on sandy and clay soils.	No	Preferred habitat not present. Species not observed by NRSI biologists during vegetation inventories.	No	Preferred habitat not present. Species not observed by NRSI biologists during vegetation inventories.	No	Preferred habitat not present. Vegetation inventories will be completed in 2020.
Gymnocladus dioicus	Kentucky Coffee-tree	S2	THR	T	T	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Kentucky Coffee-tree is found in a variety of habitats, but grows best on moist, rich soil. Consequently, it is often found in floodplains, though it will tolerate shallow rocky or sandy soils. It is shade-intolerant, and therefore grows along the edges of woodlots or relies on canopy openings in forests and woodlots.	No	Preferred habitat not present. Species not observed by NRSI biologists during vegetation inventories.	No	Preferred habitat not present. Species not observed by NRSI biologists during vegetation inventories.	No	Preferred habitat not present. Vegetation inventories will be completed in 2020.
Juglans cinerea	Butternut	S2?	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Stream banks, swamps, and upland beech-maple, oak-hickory, and mixed hardwood stands.	Yes	NRSI biologists confirmed the presence of Butternut during vegetation and tree inventories. Butternut Health Assessments to be conducted to evaluate genetic makeup of all trees.	Yes	NRSI biologists confirmed the presence of Butternut during vegetation and tree inventories. Butternut Health Assessments to be conducted to evaluate genetic makeup of all trees.	Possible	Butternut is present within the study area. Vegetation inventories will be completed in 2020 to determin if the species is present.
Magnolia acuminata	Cucumber Tree	S2	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Rich, partly open, moist to wet woods.	No	Preferred habitat not present. Species not observed by NRSI biologists during vegetation inventories.	No	Preferred habitat not present. Species not observed by NRSI biologists during vegetation inventories.	No	Preferred habitat not present. Vegetation inventories will be completed in 2020.
Morus rubra	Red Mulberry	S2	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Moist woods and wooded river valleys.	No	Preferred habitat not present. Species not observed by NRSI biologists during vegetation inventories.	No	Preferred habitat not present. Species not observed by NRSI biologists during vegetation inventories.	No	Preferred habitat not present. Vegetation inventories will be completed in 2020.
Panax quinquefolius	American Ginseng	S2	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Deep leaf litter in rich, moist deciduous woods, especially on rocky, shaded cool slopes in sweet soil	No	Preferred habitat not present. Species not observed by NRSI biologists during vegetation inventories.	No	Preferred habitat not present. Species not observed by NRSI biologists during vegetation inventories.	No	Preferred habitat not present. Vegetation inventories will be completed in 2020.
Phegopteris hexagonoptera	Broad Beech Fern	S3	SC	SC	SC	Schedule 3	SAR in Hamilton Region (MNRF 2019c)	Rich deciduous woods.	No	Preferred habitat not present. Species not observed by NRSI biologists during vegetation inventories.	No	Preferred habitat not present. Species not observed by NRSI biologists during vegetation inventories.	No	Preferred habitat not present. Vegetation inventories will be completed in 2020.
Ptelea trifoliata	Common Hop-tree	S3	SC	SC	SC	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Shorelines and other dry sites.	No	Preferred habitat not present. Species not observed by NRSI biologists during vegetation inventories.	No	Preferred habitat not present. Species not observed by NRSI biologists during vegetation inventories.	No	Preferred habitat not present. Vegetation inventories will be completed in 2020.

Scientific Name	Common Name	S-RANK[1]	SARO[1]	COSEWIC[1,2]	SARA Status[2]	SARA Schedule[2]	Background Source	Habitat Preference[3,4,5,6,7]	East A and East B Blocks		Central Block		West Block	
									Suitable Habitat Present?	Rationale	Suitable Habitat Present?	Rationale	Suitable Habitat Present?	Rationale
Pycnanthemum incanum	Hoary Mountain-mint	S1	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Dry woodlands in partial shade of oaks and in openings.	No	Preferred habitat not present. Species not observed by NRSI biologists during vegetation inventories.	No	Preferred habitat not present. Species not observed by NRSI biologists during vegetation inventories.	No	Preferred habitat not present. Vegetation inventories will be completed in 2020.
Trichophorum planifolium	Bashful Clubrush	S1	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Open-canopied deciduous and mixed forests that have few shrubs in the understory. Requires warmth and good drainage.	No	Preferred habitat not present. Species not observed by NRSI biologists during vegetation inventories.	No	Preferred habitat not present. Species not observed by NRSI biologists during vegetation inventories.	No	Preferred habitat not present. Vegetation inventories will be completed in 2020.
Tetraneuris herbacea	Lakeside Daisy	S3	THR	T	T	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Grassland and pavement alvars.	No	Preferred habitat not present. Species not observed by NRSI biologists during vegetation inventories.	No	Preferred habitat not present. Species not observed by NRSI biologists during vegetation inventories.	No	Preferred habitat not present. Vegetation inventories will be completed in 2020.
Birds														
Ammodramus savannarum	Grasshopper Sparrow	S4B	SC	SC	SC	Schedule 1	OBBA (BSC et al. 2006), SAR in Hamilton Region (MNRF 2019c)	Well-drained grassland or prairie with low cover of grasses, taller weeds on sandy soil; hayfields or weedy fallow fields; uplands with ground vegetation of various densities; perches for singing; requires tracts of grassland > 10 ha	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	Possible	Naturalized golf course may provide suitable habitat. Breeding bird surveys will be conducted in 2020.
Antrostomus vociferus	Eastern Whip-poor-will	S4B	THR	T	T	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Dry, open, deciduous woodlands of small to medium trees; oak or beech with lots of clearings and shaded leaflitter; wooded edges, forest clearings with little herbaceous growth; pine plantations; associated with >100 ha forests; may require 500 to 1000 ha to maintain population	No	Preferred habitat not present. Species not observed by NRSI biologists.	No	Preferred habitat not present. Species not observed by NRSI biologists.	No	Preferred habitat not present.
Asio flammeus	Short-eared Owl	S2N, S4B	SC	SC	SC	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Grasslands, open areas or meadows that are grassy or bushy; marshes, bogs or tundra; both diurnal and nocturnal habits; ground nester; destruction of wetlands by drainage for agriculture is an important factor in the decline of this species; home range 25 -125 ha; requires 75-100 ha of contiguous open habitat	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Breeding Bird surveys will be completed in 2020.
Cardellina canadensis	Canada Warbler	S4B	SC	T	T	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Interior forest habitats with a dense, well-developed shrub and vegetation understory; along riparian zones or wet bottomland habitat. require tracts of land which are >30ha	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Breeding Bird surveys will be completed in 2020.
Centronyx henslowii	Henslow's Sparrow	SHB	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	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; a moderate amount of moisture needed; requires a minimum tract of grassland of 40 ha, but usually in areas >100 ha	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Breeding Bird surveys will be completed in 2020.
Chaetura pelagica	Chimney Swift	S4B, S4N	THR	T	T	Schedule 1	OBBA (BSC et al. 2006), SAR in Hamilton Region (MNRF 2019c)	Commonly found in urban areas near buildings; nests in hollow trees, crevices of rock cliffs, chimneys; highly gregarious; feeds over open water	No	Preferred habitat (uncapped chimneys) potentially present in the abandoned residence in the East 'B' Block, however species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat (uncapped chimneys) potentially present in the abandoned residence. Species observed foraging on site outside of the breeding season (August 2019) on lands adjacent to Central Block, but no breeding evidence was observed. Species not observed during breeding bird surveys.	No	Preferred habitat not present. Breeding Bird surveys will be completed in 2020.
Charadrius melodus	Piping Plover	S1B	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Dry, sandy outer beaches; upper stretches near dunes, usually large open, grassless areas, but sometimes with sparse scattering of beach grass; recreational uses of beaches results in habitat loss	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Breeding Bird surveys will be completed in 2020.
Chlidonias niger	Black Tern	S3B	SC	NAR	NS	No Schedule	SAR in Hamilton Region (MNRF 2019c)	Wetlands, coastal or inland marshes; large cattail marshes, marshy edges of rivers, lakes or ponds, wet open fens, wet meadows; returns to same area to nest each year in loose colonies; must have shallow (0.5 to 1 m deep) water and areas of open water near nests; requires marshes >20 ha in size; feeds over adjacent grasslands for insects; also feeds on fish, crayfish and frogs	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Breeding Bird surveys will be completed in 2020.

Scientific Name	Common Name	S-RANK[1]	SARO[1]	COSEWIC[1,2]	SARA Status[2]	SARA Schedule[2]	Background Source	Habitat Preference[3,4,5,6,7]	East A and East B Blocks		Central Block		West Block	
									Suitable Habitat Present?	Rationale	Suitable Habitat Present?	Rationale	Suitable Habitat Present?	Rationale
Chordeiles minor	Common Nighthawk	S4B	SC	SC	T	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Open ground; clearings in dense forests; ploughed fields; gravel beaches or barren areas with rocky soils; open woodlands; flat gravel roofs	No	Preferred habitat not present. Species not observed by NRSI biologists.	No	Preferred habitat not present. Species not observed by NRSI biologists.	No	Preferred habitat not present.
Contopus virens	Eastern Wood-Pewee	S4B	SC	SC	SC	Schedule 1	OBBA (BSC et al. 2006), MNRF Records (MNRF 2018), SAR in Hamilton Region (MNRF 2019c)	Open, deciduous, mixed or coniferous forest; predominated by oak with little understory; forest clearings, edges; farm woodlots, parks	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	Yes	Preferred habitat of forest edges and farm woodlots is present. Species was observed by NRSI biologists during breeding bird surveys and possible breeding evidence was observed.	No	Preferred habitat may be present in the wooded features adjacent to the West Block, however habtiat is absent from within the block. Breeding Bird surveys will be completed in 2020.
Dolichonyx oryzivorus	Bobolink	S4B	THR	T	T	Schedule 1	OBBA (BSC et al. 2006), SAR in Hamilton Region (MNRF 2019c)	Large, open expansive grasslands with dense ground cover; hayfields, meadows or fallow fields; marshes; requires tracts of grassland >50 ha	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Breeding Bird surveys will be completed in 2020.
Empidonax virescens	Acadian Flycatcher	S2S3B	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Mature, shady, deciduous forests; heavily wooded ravines; creek bottoms or river swamps; availability of good quality habitat is limiting factor; needs at least 30 ha of forest	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Breeding Bird surveys will be completed in 2020.
Falco peregrinus	Peregrine Falcon	S3B	SC	NAR	SC	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Rock cliffs, crags, especially situated near water; tall buildings in urban centres; threatened by chemical contamination; reintroduction efforts have been attempted in numerous locations throughout Ontario	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Breeding Bird surveys will be completed in 2020.
Haliaeetus leucocephalus	Bald Eagle	S2N, S4B	SC	NAR	NS	No Schedule	SAR in Hamilton Region (MNRF 2019c)	Require large continuous area of deciduous or mixed woods around large lakes, rivers; require area of 255 ha for nesting, shelter, feeding, roosting; prefer open woods with 30 to 50% canopy cover; nest in tall trees 50 to 200 m from shore; require tall, dead, partially dead trees within 400 m of nest for perching; sensitive to toxic chemicals	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Breeding Bird surveys will be completed in 2020.
Hirundo rustica	Barn Swallow	S5B	THR	T	T	Schedule 1	OBBA (BSC et al. 2006), MNRF Records (MNRF 2018), SAR in Hamilton Region (MNRF 2019c)	Farmlands or rural areas; cliffs, caves, rock niches; buildings or other man-made structures for nesting; open country near body of water	Yes	Foraging habitat present, species observed by NRSI biologists entering and exiting the abandoned residential building in the East B Block during breeding bird surveys. Barn Swallow breeding at this location considered probable.	Yes	Foraging habitat present, species observed incidentally by NRSI biologists during field surveys (no breeding evidence observed).	Yes	Foraging habitat present, nest cup observed by NRSI biologists in the abandoned golf course clubhouse in early spring, with adults nearby carrying nesting material. Barn Swallow breeding at this location considered likely, to be confirmed by additional surveys in 2020.
Hylocichla mustelina	Wood Thrush	S4B	SC	T	T	Schedule 1	OBBA (BSC et al. 2006), MNRF Records (MNRF 2018), SAR in Hamilton Region (MNRF 2019c)	Carolinian and Great Lakes-St. Lawrence forest zones; undisturbed moist mature deciduous or mixed forest with deciduous sapling growth; near pond or swamp; hardwood forest edges; must have some trees higher than 12 m	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Breeding Bird surveys will be completed in 2020.
Icteria virens	Yellow-breasted Chat	S1B	END	E	E	Schedule 1	OBBA (BSC et al. 2006), SAR in Hamilton Region (MNRF 2019c)	Thickets, tall tangles of shrubbery beside streams, ponds; overgrown bushy clearings with deciduous thickets; nests above ground in bush, vines etc.	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Breeding Bird surveys will be completed in 2020.
Ixobrychus exilis	Least Bittern	S4B	THR	T	T	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Deep marshes, swamps, bogs; marshy borders of lakes, ponds, streams, ditches; dense emergent vegetation of cattail, bulrush, sedge; nests in cattails; intolerant of loss of habitat and human disturbance	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Breeding Bird surveys will be completed in 2020.
Lanius ludovicianus	Loggerhead Shrike	S2B	END	E	NS	No Schedule	SAR in Hamilton Region (MNRF 2019c)	Grazed pasture, marginal farmland with scattered hawthorn shrubs, hedgerows; fence posts, wires and associated low-lying wetland; located on core areas of limestone plain adjacent to Canadian Shield; greatest threat is fragmentation of suitable habitat due to natural succession; probably needs at least 25 ha of suitable habitat	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Breeding Bird surveys will be completed in 2020.
Melanerpes erythrocephalus	Red-headed Woodpecker	S4B	SC	E	T	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Open, deciduous forest with little understory; fields or pasture lands with scattered large trees; wooded swamps; orchards, small woodlots or forest edges; groves of dead or dying trees; feeds on insects and stores nuts or acorns for winter; loss of habitat is limiting factor; requires cavity trees with at least 40 cm dbh; require about 4 ha for a territory	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Breeding Bird surveys will be completed in 2020.

Scientific Name	Common Name	S-RANK[1]	SARO[1]	COSEWIC[1,2]	SARA Status[2]	SARA Schedule[2]	Background Source	Habitat Preference[3,4,5,6,7]	East A and East B Blocks		Central Block		West Block	
									Suitable Habitat Present?	Rationale	Suitable Habitat Present?	Rationale	Suitable Habitat Present?	Rationale
Parkesia motacilla	Louisiana Waterthrush	S3B	THR	T	T	Schedule 1	OBBA (BSC et al. 2006)	Prefers wooded ravines with running streams; also woodlands swamps; large tracts of mature deciduous or mixed forests; canopy cover is essential; has strong affinity to nest sites; nests on ground	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Breeding Bird surveys will be completed in 2020.
Pelecanus erythrorhynchos	American White Pelican	S2B	THR	NAR	NS	No Schedule	SAR in Hamilton Region (MNRF 2019c)	Small, remote bedrock islands in freshwater permanent lakes; sparsely vegetated with grasses, nettles, shrubs, trees; intolerant of disturbance; colonial nester often with Double-crested Cormorants and Herring Gulls	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Breeding Bird surveys will be completed in 2020.
Phalaropus lobatus	Red-necked Phalarope	S3S4B	SC	SC	SC	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Coastal and inland marshes where it feeds in shallow ponds and nests on the grassy edges. It avoids mud and dense shrubs. Nests are located on the ground in dense grasses and sedges. During migration and in the winter, the Red-necked Phalarope is always near water, either saltwater, or freshwater ponds, lakes, ditches or lagoons.	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Breeding Bird surveys will be completed in 2020.
Podiceps auritus	Horned Grebe	S1B, S4N	SC	SC	SC	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Deep water marshes or sloughs with a mix of open water, emergent vegetation; small freshwater ponds or protected bays of larger lakes with emergent vegetation; territories are about 1 ha, but birds are very territorial	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Breeding Bird surveys will be completed in 2020.
Protonotaria citrea	Prothonotary Warbler	S1B	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Area sensitive species preferring 100 ha of flooded or swampy woodlands with standing or flowing water and more than 25% canopy cover with numerous stumps and snags; stream borders or flooded bottomlands; soft, dead trees with dbh >10 cm; Carolinian species	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Breeding Bird surveys will be completed in 2020.
Rallus elegans	King Rail	S2B	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Large, shallow, fresh water marshes, shrubby swamps, marshy borders of lakes and ponds with abundant vegetation; an 'edge' species; territories are 0.3 to 0.5 ha; loss of large marshes in the south is limiting to this species	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Breeding Bird surveys will be completed in 2020.
Riparia riparia	Bank Swallow	S4B	THR	T	T	Schedule 1	OBBA (BSC et al. 2006), SAR in Hamilton Region (MNRF 2019c)	Sand, clay or gravel river banks or steep riverbank cliffs; lakeshore bluffs of easily crumbled sand or gravel; gravel pits, road-cuts, grassland or cultivated fields that are close to water; nesting sites are limiting factor for species presence	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Breeding Bird surveys will be completed in 2020.
Setophaga cerulea	Cerulean Warbler	S3B	THR	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Mature deciduous woodland of Great Lakes-St. Lawrence and Carolinian forests, sometimes coniferous; swamps or bottomlands with large trees; area sensitive species needing extensive areas of forest (>100 ha)	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Breeding Bird surveys will be completed in 2020.
Sturnella magna	Eastern Meadowlark	S4B	THR	T	T	Schedule 1	OBBA (BSC et al. 2006), MNRF Records (MNRF 2018), SAR in Hamilton Region (MNRF 2019c)	Open, grassy meadows, farmland, pastures, hayfields or grasslands with elevated singing perches; cultivated land and weedy areas with trees; old orchards with adjacent, open grassy areas >10 ha in size	No	Preferred habitat is not present. Species was incidentally observed by NRSI biologists outside of the breeding period in the East A Block subject site (no evidence of breeding)	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat is not present. Naturalized golf course disturbed by tree removal and surface tilling in spring 2020; vegetation regrowth stunted and signing perches absent. Habitat not suitable for Eastern Meadowlark breeding habitat. Breeding bird surveys will be completed in 2020.
Tyto alba	Barn Owl	S1	END	E	E	Schedule 1	OBBA (BSC et al. 2006), SAR in Hamilton Region (MNRF 2019c)	Open areas such as fields, agricultural lands with scattered woodlots, buildings and/or orchards; grasslands, sedge meadows, marshes; snow-cover limits ability to catch prey; species has intolerance to severe cold; nests in hollow trees and live trees >46 cm dbh; also nests in barns, abandoned buildings	No	Preferred habitat may be present although the species is noted as extirpated in Hamilton Region and occurences within any portion of Ontario are extremely rare. Species not observed by NRSI biologists.	No	Preferred habitat may be present although the species is noted as extirpated in Hamilton Region and occurences within any portion of Ontario are extremely rare. Species not observed by NRSI biologists.	No	Preferred habitat may be present although the species is noted as extirpated in Hamilton Region and occurences within any portion of Ontario are extremely rare.
Vermivora chrysoptera	Golden-winged Warbler	S4B	SC	T	T	Schedule 1	OBBA (BSC et al. 2006), SAR in Hamilton Region (MNRF 2019c)	Early successional habitat; shrubby, grassy abandoned fields with small deciduous trees bordered by low woodland and wooded swamps; alder bogs; deciduous, damp woods; shrubbery clearings in deciduous woods with saplings and grasses; brier-woodland edges; requires >10 ha	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	No	Preferred habitat not present. Species not observed by NRSI biologists during breeding bird surveys.	Possible	Naturalized golf course may provide suitable habitat. Breeding bird surveys will be conducted in 2020.

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									Suitable Habitat Present?	Rationale	Suitable Habitat Present?	Rationale	Suitable Habitat Present?	Rationale
Herpetofauna														
Ambystoma laterale - (2) jeffersonianum	Unisexual *Ambystoma* Jefferson dependent population	S2	END	E	NS	No Schedule	SAR in Hamilton Region (MNRF 2019c)	Damp shady deciduous forest, swamps, moist pasture, lakeshores; temporary woodland pools for breeding; hides under leaf litter, stones or in decomposing logs	No	Preferred habitat not present. Species not observed by NRSI biologists.	No	Preferred habitat not present. Species not observed by NRSI biologists.	No	Preferred habitat not present. Species not observed by NRSI biologists.
Ambystoma jeffersonianum	Jefferson Salamander	S2	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019c), ORAA (Ontario Nature 2019)	Damp shady deciduous forest, swamps, moist pasture, lakeshores; temporary woodland pools for breeding; hides under leaf litter, stones or in decomposing logs	No	Preferred habitat not present. Species not observed by NRSI biologists.	No	Preferred habitat not present. Species not observed by NRSI biologists.	No	Preferred habitat not present. Species not observed by NRSI biologists.
Apalone spinifera	Eastern Spiny Softshell	S2	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Intolerant of pollution; large river systems, shallow lakes and ponds with muddy bottoms and aquatic vegetation; basks on sandbars, mud flats, grassy beaches, logs or rocks; eggs are laid near water on sandy beaches or gravel banks in areas with sun; requires acceptable feeding, nesting, habitat and natural, undisturbed corridors between these critical habitats	No	Preferred habitat not present. Species not observed by NRSI biologists.	No	Preferred habitat not present. Species not observed by NRSI biologists.	No	Preferred habitat not present. Species not observed by NRSI biologists.
Chelydra serpentina	Snapping Turtle	S4	SC	SC	SC	Schedule 1	ORAA (Ontario Nature 2019), MNRF Records (MNRF 2018)	Permanent, semi-permanent fresh water; marshes, swamps or bogs; rivers and streams with soft muddy banks or bottoms; often uses soft soil or clean dry sand on south-facing slopes for nest sites; may nest at some distance from water; often hibernate together in groups in mud under water; home range size ~28 ha	No	Preferred habitat not present. Species not observed by NRSI biologists.	No	Preferred habitat not present. Species not observed by NRSI biologists.	Yes	Preferred habtiat present in small pond in southwest corner of the West Block. Species confirmed as present by NRSI biologists during spring 2020 turtle emergence and basking surveys.
Emydoidea blandingii	Blanding's Turtle (Great Lakes/St Lawrence population)	S3	THR	E	T	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Shallow water marshes, bogs, ponds or swamps, or coves in larger lakes with soft muddy bottoms and aquatic vegetation; basks on logs, stumps or banks; surrounding natural habitat is important in summer as they frequently move from aquatic habitat to terrestrial habitats; hibernates in bogs; not readily observed.	No	Preferred habitat not present. Species not observed by NRSI biologists.	No	Preferred habitat not present. Species not observed by NRSI biologists.	No	Preferred habitat not present. Species not observed by NRSI biologists.
Graptemys geographica	Northern Map Turtle	S3	SC	SC	SC	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Large bodies of water with soft bottoms, and aquatic vegetation; basks on logs or rocks or on beaches and grassy edges, will bask in groups; uses soft soil or clean dry sand for nest sites; may nest at some distance from water.	No	Preferred habitat not present. Species not observed by NRSI biologists.	No	Preferred habitat not present. Species not observed by NRSI biologists.	No	Preferred habitat not present. Species not observed by NRSI biologists.
Heterodon platirhinos	Eastern Hog-nosed Snake	S3	THR	T	T	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Sandy upland fields, pastures, savannahs, sandy beaches; dry open oak-pine-maple forest with sandy soils; prefer forest areas > 5ha	No	Preferred habitat not present. Species not observed by NRSI biologists.	No	Preferred habitat not present. Species not observed by NRSI biologists.	No	Preferred habitat not present. Species not observed by NRSI biologists.
Pantherophis spiloides pop. 2	Gray Ratsnake (Carolinian population)	S1	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Shrubby, old field, deciduous or mixed forests, thickets, field edges, rocky hillsides, river bottoms; talus slopes; uses talus slopes, unused wells or cisterns for hibernation; will hibernate in groups with other snakes	No	Preferred habitat not present. Species not observed by NRSI biologists.	No	Preferred habitat not present. Species not observed by NRSI biologists.	No	Preferred habitat not present. Species not observed by NRSI biologists.
Pseudacris triseriata pop. 2	Western Chorus Frog (Great Lakes/St. Lawrence - Canadian Shield Population)	S4	NAR	T	T	Schedule 1	ORAA (Ontario Nature 2019)	Roadside ditches or temporary ponds in fields; swamps or wet meadows; woodland or open country with cover and moisture; small ponds and temporary pools ponds and temporary pools	No	Preferred habitat may be present. Species not observed by NRSI biologists during anuran call surveys.	No	Preferred habitat may be present. Species not observed by NRSI biologists during anuran call surveys.	No	Preferred habitat may be present. Anuran call surveys will be completed in 2020.
Sternotherus odoratus	Eastern Musk Turtle	S3	SC	SC	SC	Schedule 1	SAR in Hamilton Region (MNRF 2019c), ORAA (Ontario Nature 2019)	Aquatic, except when laying eggs; shallow slow moving water of lakes, streams, marshes and ponds; hibernate in underwater mud, in banks or in muskrat lodges; eggs are laid in debris or under stumps or fallen logs at waters edge; often share nest sites; sometimes congregate at hibernation sites; not readily observed	No	Preferred habitat not present. Species not observed by NRSI biologists.	No	Preferred habitat not present. Species not observed by NRSI biologists.	No	Preferred habitat not present. Species not observed by NRSI biologists.
Thamnophis sauritus septentrionalis	Northern Ribbonsnake	S4	SC	SC	SC	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Sunny grassy areas with low dense vegetation near bodies of shallow permanent quiet water; wet meadows grassy marshes or sphagnum bogs; borders of ponds, lakes or streams; hibernates in groups	No	Preferred habitat not present. Species not observed by NRSI biologists.	No	Preferred habitat not present. Species not observed by NRSI biologists.	No	Preferred habitat not present. Species not observed by NRSI biologists.
Mammals														
Microtus pinetorum	Woodland Vole	S3?	SC	SC	SC	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Mature deciduous forest in the Carolinian forest zone, with loose sandy soil and deep humus; grasslands, meadows and orchards with groundcover of duff or grass	No	Preferred habitat not present. Species not observed by NRSI biologists.	No	Preferred habitat not present. Species not observed by NRSI biologists.	No	Preferred habitat not present. Species not observed by NRSI biologists.

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									Suitable Habitat Present?	Rationale	Suitable Habitat Present?	Rationale	Suitable Habitat Present?	Rationale
Myotis leibii	Eastern Small-footed Myotis	S2S3	END	-	-	-	SAR in Hamilton Region (MNRF 2019c)	Hibernates in cool caves and abandoned mines; roosts in rocky habitats including talus slopes and open rock barrens. May also roost in man-made structures, however, very rarely; foraging habitat poorly understood in Ontario. Within the United States of America, it feeds primarily in forests, but also over waterbodies, within riparian forests, and occasionally open fields.	No	Preferred habitat not present.	No	Preferred habitat not present.	No	Preferred habitat not present.
Myotis lucifungus	Little Brown Myotis	S3	END	E	E	Schedule 1	Ontario Mammal Atlas (Dobbyn 1994), SAR in Hamilton Region (MNRF 2019c)	Uses caves, quarries, tunnels, hollow trees or buildings for roosting; winters in humid caves; maternity sites in dark warm areas such as attics and barns; feeds primarily in wetlands, forest edges	Yes	Several candidate roosting trees and buildings are present. Consultation with MECP and additional surveys may be required.	Yes	Several candidate roosting trees and buildings are present. Consultation with MECP and additional surveys may be required.	Possible	Candidate roosting trees and buildings may be present. Surveys will be completed to determine extent of suitable habtiat on site.
Myotis septentrionalis	Northern Myotis	S3	END	E	E	Schedule 1	Ontario Mammal Atlas (Dobbyn 1994), SAR in Hamilton Region (MNRF 2019c)	Hibernates during winter in mines or caves; during summer males roost alone and females form maternity colonies of up to 60 adults; roosts in houses, man-made structures but prefers hollow trees or under loose bark; hunts within forest, below canopy	Yes	Several candidate roosting trees and buildings are present. Consultation with MECP and additional surveys may be required.	Yes	Several candidate roosting trees and buildings are present. Consultation with MECP and additional surveys may be required.	Possible	Candidate roosting trees and buildings may be present. Surveys will be completed to determine extent of suitable habtiat on site.
Perimyotis subflavus	Tri-colored Bat	S3?	END	E	E	Schedule 1	Ontario Mammal Atlas (Dobbyn 1994), SAR in Hamilton Region (MNRF 2019c)	Variety of forested habitats. Older forests and occasionally in barns or other structures may be used for roosts. They forage over water and along streams in the forest. Roost in clusters of dead leaves in oak and maples species.	Yes	Several candidate roosting trees are present. Consultation with MECP and additional surveys may be required.	Yes	Several candidate roosting trees are present. Consultation with MECP and additional surveys may be required.	Possible	Candidate roosting trees may be present. Surveys will be completed to determine extent of suitable habtiat on site.
Taxidea taxus jacksoni	American Badger (Southwestern Ontario population)	S1	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Open grasslands and oak savannahs; dens in new hole or enlarged existing hole; sometimes makes food caches	No	Preferred habitat not present. Species not observed by NRSI biologists.	No	Preferred habitat not present. Species not observed by NRSI biologists.	No	Preferred habitat not present. Species not observed by NRSI biologists.
Urocyon cinereoargenteus	Gray Fox	S1	THR	T	T	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Hardwood forests with a mix of fields and woods; swamps; wooded, brushy or rocky habitats; woodland farmland edge; old fields with thickets; dens in hollow log or tree; individual has numerous winter dens throughout its range which is > 40 ha	No	Preferred habitat not present. Species not observed by NRSI biologists.	No	Preferred habitat not present. Species not observed by NRSI biologists.	No	Preferred habitat not present. Species not observed by NRSI biologists.
Insects														
Bombus bohemicus	Gypsy Cuckoo Bumble Bee	S1S2	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Open meadows, agricultural and urban areas, boreal forest and woodlands.	No	Candidate habitat present. However, species not observed by NRSI biologists during targeted insect surveys.	No	Candidate habitat present. However, species not observed by NRSI biologists during targeted insect surveys.	Possible	Candidate habitat present. Insect surveys to be completed in 2020.
Danaus plexippus	Monarch	S2N, S4B	SC	E	SC	Schedule 1	SAR in Hamilton Region (MNRF 2019c), TEA Atlas (Macnaughton et al. 2019)	Exist primarily wherever milkweed and wildflowers exist; abandoned farmland, along roadsides, and other open spaces	No	Candidate habitat and host plants present. However, abundance of milkweed was too low to support a breeding population. Several foraging Monarch were observed by NRSI biologists.	No	Candidate habitat and host plants present. However, abundance of milkweed was too low to support a breeding population. Several foraging Monarch were observed by NRSI biologists.	No	Preferred habitat not present. Insect surveys to be completed in 2020.
Erynnis martialis	Mottled Duskywing	S2	END	E	NS	No Schedule	SAR in Hamilton Region (MNRF 2019c)	Oak or pine savannas or open woodlands; also non-coastal pine barrens or grassy openings within these communities	No	Preferred habitat not present. Species not observed by NRSI biologists during targeted insect surveys.	No	Preferred habitat not present. Species not observed by NRSI biologists during targeted insect surveys.	No	Preferred habitat not present. Insect surveys to be completed in 2020.
Coccinella novemnotata	Nine-spotted Lady Beetle	SH	END	E	NS	No Schedule	SAR in Hamilton Region (MNRF 2019c)	Agricultural areas, suburban gardens, parks, coniferous forests, deciduous forests, prairie grasslands, meadows, riparian areas, and isolated natural areas.	No	Candidate habitat present. However, species not observed by NRSI biologists during targeted insect surveys.	No	Candidate habitat present. However, species not observed by NRSI biologists during targeted insect surveys.	Possible	Candidate habitat present. Insect surveys to be completed in 2020.
Bombus afinis	Rusty-patched Bumble Bee	S1	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Open habitat such as mixed farmland, oak savannah, urban settings, and sand dunes.	No	Candidate habitat present. However, species not observed by NRSI biologists during targeted insect surveys.	No	Candidate habitat present. However, species not observed by NRSI biologists during targeted insect surveys.	Possible	Candidate habitat present. Insect surveys to be completed in 2020.
Thorybes bathyllus	Southern Cloudywing	S3	-	-	-	-	TEA Atlas (Macnaughton et al. 2019)	Dry, usually rocky or sandy scrub, barrens, open woodlands, and prairies. Generally somewhat disturbed areas but still containing native vegetation.	No	Candidate habitat present. However, species not observed by NRSI biologists during targeted insect surveys.	No	Candidate habitat present. However, species not observed by NRSI biologists during targeted insect surveys.	Possible	Candidate habitat present. Insect surveys to be completed in 2020.
Pieris virginiensis	West Virginia White	S3	SC	-	-	-	SAR in Hamilton Region (MNRF 2019c)	Mesic hardwood or hardwood-northern conifer-mixed forests on rich soils, including hardwood swamps. An important feature is plentiful supply of the foodplants, generally toothworts	No	Preferred habitat not present. Species not observed by NRSI biologists during targeted insect surveys.	No	Preferred habitat not present. Species not observed by NRSI biologists during targeted insect surveys.	No	Preferred habitat not present. Insect surveys to be completed in 2020.
Bombus terricola	Yellow-banded Bumble Bee	S3S5	SC	-	-	-	SAR in Hamilton Region (MNRF 2019c)	Mixed woodlands and open habitat such as native grasslands, farmlands and urban areas. Close to or within wooded areas or wetlands.	No	Preferred habitat not present. Species not observed by NRSI biologists during targeted insect surveys.	No	Preferred habitat not present. Species not observed by NRSI biologists during targeted insect surveys.	No	Preferred habitat not present. Insect surveys to be completed in 2020.

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Freshwater Fishes														
Acipenser fulvescens pop. 3	Lake Sturgeon (Great Lakes - Upper St. Lawrence River populations)	S2	THR	T	NS	No Schedule	SAR in Hamilton Region (MNRF 2019c)	Freshwater lakes and rivers with soft bottoms of mud, sand or gravel. They are usually found at depths of five to 20 metres. They spawn in relatively shallow, fast-flowing water (usually below waterfalls, rapids, or dams) with gravel and boulders at the bottom.	No	Preferred habitat not present.	No	Preferred habitat not present.	No	Preferred habitat not present.
Anguilla rostrata	American Eel	S1?	END	T	NS	No Schedule	SAR in Hamilton Region (MNRF 2019c)	Starts life in the Sargasso Sea in the North Atlantic Ocean and migrates along the east coast of North America. In Canada, it is found in fresh water and salt water areas that are accessible from the Atlantic Ocean. This area extends from Niagara Falls in the Great Lakes up to the mid-Labrador coast. In Ontario, American Eels can be found as far inland as Algonquin Park. Once the eels mature (10-25 years) they return to the Sargasso Sea to spawn.	No	Preferred habitat not present.	No	Preferred habitat not present.	No	Preferred habitat not present.
Clinostomus elongatus	Redside Dace	S2	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Prefers pools and slow-moving sections of relatively small (<10 m width), clear, cool, streams with sand or gravel bottoms , riffle/pool habitat and overhanging vegetation; preferred water temperature range 14-23°C	No	Preferred habitat not present.	No	Preferred habitat not present.	No	Preferred habitat not present.
Esox americanus vermiculatus	Grass Pickerel	S3	SC	SC	SC	Schedule 1	MNRF Records (MNRF 2018), SAR in Hamilton Region (MNRF 2019c), Aquatic SAR Mapping (DFO 2019)	Found in wetlands, ponds, slow-moving streams and shallow bays of larger lakes with warm, shallow, clear water and an abundance of aquatic plants.	Possible	Candidate wetland breeding habitat present in the study area east of East B Block, but not within the site. Electrofishing to determine species presence or absence is requried.	No	Preferred habitat not present.	No	Preferred habitat not present.
Ichthyomyzon fossor	Northern Brook Lamprey	S3	SC	SC	SC	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Clear streams of varying sizes; spawning habitat usually includes a swift current and coarse gravel or rocky substrate.	No	Preferred habitat not present.	No	Preferred habitat not present.	No	Preferred habitat not present.
Ichthyomyzon unicuspis pop. 1	Silver Lamprey (Great Lakes - Upper St. Lawrence populations)	S3	SC	SC	SC	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Silver lampreys require clear water so they can find fish hosts, relatively clean stream beds of sand and organic debris for larvae to live in, and unrestricted migration routes for spawning. They use different kinds of habitat throughout their lives (rivers for spawning and early development, and lakes for adults).	No	Preferred habitat not present.	No	Preferred habitat not present.	No	Preferred habitat not present.
Moxostoma duquesnei	Black Redhorse	S2	THR	T	T	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Lives in pools and riffle areas of medium-sized rivers and streams that are usually less than two metres deep. These rivers usually have few aquatic plants, a moderate to fast current, and a sandy or gravel bottom. In the spring, it migrates to breeding habitat where eggs are laid on gravel in fast water. The winter is spent in deeper pools. Adults feed on crustaceans and aquatic insects, while the young fish feed on plankton.	No	Preferred habitat not present.	No	Preferred habitat not present.	No	Preferred habitat not present.
Notropis photogenis	Silver Shiner	S2S3	THR	T	T	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Silver shiners prefer moderate to large size streams with swift currents that are free of weeds and have clean gravel or boulder bottoms.	No	Preferred habitat not present.	No	Preferred habitat not present.	No	Preferred habitat not present.
Freshwater Molluscs														
Ligumia nasuta	Eastern Pondmussel	S1	END	SC	SC	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Generally inhabit sheltered areas of lakes or slow streams in substrates of fine sand and mud.	No	Preferred habitat not present.	No	Preferred habitat not present.	No	Preferred habitat not present.
Quadrula quadrula	Mapleleaf	S2	THR	SC	SC	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Generally found in medium to large rivers in firmly packed substrate.	No	Preferred habitat not present.	No	Preferred habitat not present.	No	Preferred habitat not present.
Toxolasma parvum	Lilliput	S1	THR	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Found in a variety of habitats including small to large rivers, wetlands, shallows of lakes, ponds and reservoirs. They are common in soft substrates with over 50% of the substrate type comprised of sand and a mud/muck/silt combination. Typically occur with or near Green Sunfish, Bluegill, White Crappie, and Johnny Darter	No	Preferred habitat not present.	No	Preferred habitat not present.	No	Preferred habitat not present.

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									Suitable Habitat Present?	Rationale	Suitable Habitat Present?	Rationale	Suitable Habitat Present?	Rationale
Villosa iris	Rainbow	S2S3	SC	SC	SC	Schedule 1	SAR in Hamilton Region (MNRF 2019c)	Most abundant in shallow, well oxygenated reaches of small- to medium-sized rivers and sometimes lakes, on substrates of cobble, gravel, sand and occasionally mud.	No	Preferred habitat not present.	No	Preferred habitat not present.	No	Preferred habitat not present.

[1]MNRF 2020a; [2]Government of Canada 2019; [3]MNRF 2000; [4]Michigan Flora Online 2011; [5]Oldham and Brinker 2009; [6]Riley 1989; [7]Paulson 2017

Provincial Ranks							
SRANK							
S1	Critically Imperiled	**S4**	Apparently Secure	**S#?**	Uncertain Rank	**SNR**	Unranked
S2	Imperiled	**S5**	Secure	**SX**	Presumed Extirpated	**SU**	Unrankable
S3	Vulnerable	**S#S#**	Status is Between Ranks	**SH**	Possibly Extirpated (Historical)	**SNA**	Not Applicable
Breeding Status Qualifiers							
B	Breeding	**N**	Non-breeding	**M**	Migrant		
SARO							
END	Endangered	**SC**	Special Concern	**DD**	Data Deficient		
THR	Threatened	**NAR**	Not at Risk	**EXP**	Extirpated		
Federal Ranks							
COSEWIC and SARA							
E	Endangered	**SC**	Special Concern	**NS**	No Status	**N-A**	Non-Active
T	Threatened	**NAR**	Not at Risk	**DD**	Data Defficient	**X**	Extinct
SARA Schedule							
Schedule 1 Extirpated, Endangered, Threatened, Special Concern Species officially protected under SARA							
Schedule 2 Endangered, Threatened species not yet re-assessed using revised criteria; may be considered for inclusion to Schedule 1							
Schedule 3 Special Concern species not yet re-assessed using revised criteria; may be considered for inclusion to Schedule 1							

Appendix III
Significant Wildlife Habitat Screening

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	East A and East B Blocks	Central Block	West Block
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details		
Wildlife Habitat: Waterfowl Stopover and Staging Areas (Terrestrial)							
Rationale: Habitat important to migrating waterfowl	American Black Duck Northern Pintail Gadwall Blue-winged Teal Green-winged Teal American Wigeon Northern Shoveler Tundra Swan	CUM1 CUT1 - Plus evidence of annual spring flooding from 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] Information Sources • Anecdotal information from the landowner, adjacent landowners or local naturalist clubs may be good information in determining occurrence. • Reports and other information available from Conservation Authorities (CAs) • Sites documented through waterfowl planning processes (e.g. EHJV implementation plan) • Field Naturalist Clubs • Ducks Unlimited Canada • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • Any mixed species aggregations of 100[i] 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.	**Not SWH.** No evidence of aggregations of waterfowl species. Fields with spring sheet water are not present within the study area.		
Wildlife Habitat: Waterfowl Stopover and Staging Areas (Aquatic)							
Rationale: Important for local and migrant waterfowl populations during the spring or fall migration or both periods combined. Sites identified are usually only one of a few in the eco-district	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). Information Sources • Environment Canada • Naturalist clubs often are aware of staging/stopover areas • OMNRF Wetland Evaluations indicate presence of locally and regionally significant waterfowl staging. • Sites documented through waterfowl planning processes (e.g. EHJV implementation plan) • Ducks Unlimited projects • Element occurrence specification by Nature Serve: http://www.natureserve.org • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of: • Aggregations of 100[i] or more of listed species for 7 days, results in >700 waterfowl use days. • Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH[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.	**Not SWH.** Waterbodies of sufficient size to support the required concentrations of waterfowl are not present within the study area.		

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	East A and East B Blocks	Central Block	West Block
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details		
Wildlife Habitat: Shorebird Migratory Stopover Area							
Rationale: High quality shorebird stopover habitat is extremely rare and typically has a long history of use	Greater Yellowlegs Lesser Yellowlegs Marbled Godwit Hudsonian Godwit Black-bellied Plover American Golden-Plover Semipalmated Plover Solitary Sandpiper Spotted Sandpiper Semipalmated Sandpiper Pectoral Sandpiper White-rumped Sandpiper Baird's Sandpiper Least Sandpiper Purple Sandpiper Stilt Sandpiper Short-billed Dowitcher Red-necked Phalarope Whimbrel Ruddy Turnstone Sanderling Dunlin	BBO1 BBO2 BBS1 BBS2 BBT1 BBT2 SDO1 SDS2 SDT1 MAM1 MAM2 MAM3 MAM4 MAM5	Shorelines of lakes, rivers and wetlands, including beach 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. Information Sources • 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.	**Not SWH.** Shoreline habitats and suitable wetlands are not present within the study area. Generally, shorebird stopover areas are located in close proximity to the Great Lakes, large marshes or rivers.		
Wildlife Habitat: Raptor Wintering Area							
Rationale: Sites used by multiple species, a high number of individuals and used annually are most significant	Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl Special Concern: Short-eared Owl Bald Eagle	Hawks/Owls: Combination of ELC Community Series; need to have present one Community Series from each land class. Forest: FOD, FOM, FOC Upland: CUM, CUT, CUS, CUW Bald Eagle: Forest Community Series: FOD, FOM, FOC, SWD, SWM, or SWC, on shoreline areas adjacent to large rivers or adjacent to lakes with open water (hunting area).	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 available for roosting[cxlix] Information Sources • 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. • 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.	**Not SWH.** Suitably-sized combinations of field and woodland habitat are not present.		

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	East A and East B Blocks	Central Block	West Block
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details		
Wildlife Habitat: Bat Hibernacula							
Rationale: 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. Information Sources • OMNRF for possible locations and contact for local experts • Natural Heritage Information Centre (NHIC) Bat Hibernaculum • Ministry of Northern Development and Mines for location of mine shafts • Clubs that explore caves (e.g. Sierra Club) • University Biology Departments with bat experts	• All sites with confirmed hibernating bats are SWH[j]. • The area includes 200m radius around the entrance of the hibernaculum[cxlviii, ccvii, j]. 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.	**Not SWH.** However, no known hibernacula are present within 200m of the subject lands, and suitable ecosites are not present within the study area.		
Wildlife Habitat: Bat Maternity Colonies							
Rationale: Known locations of forested bat maternity colonies are extremely rare in all Ontario landscapes.	Big Brown Bat Silver-haired Bat	Maternity colonies considered SWH are found in forested Ecosites. All ELC Ecosites in ELC Community Series: FOD FOM SWD SWM	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]. Information Sources • 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[j] • >5 Adult Female Silver-haired Bats[j] • The area of the habitat includes the entire woodland or the forest stand ELC Ecosite containing the maternity colonies[j]. • 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.	**Not SWH.** Suitable deciduous or mixed forests or swamps are not present within the study area.		
Wildlife Habitat: Turtle Wintering Area							
Rationale: Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant.	Midland Painted Turtle Special Concern: 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 Information Sources • 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[j]. • One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant[j]. • 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.	**Not SWH.** Suitable permanent waterbodies or large wetlands aer not present.		**Confirmed SWH.** Turtle emergence and basking surveys conducted by NRSI biologists in early spring 2020 confirmed the presence of an overwintering Snapping Turtle (*Chelydra serpentina*) in the small pond in the southeastern corner of the West Block.

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	East A and East B Blocks	Central Block	West Block
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details		
Wildlife Habitat: Reptile Hibernaculum							
Rationale: Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant	Snakes: Eastern Gartersnake Northern Watersnake Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake Special Concern: Milksnake Eastern Ribbonsnake	For all snakes, habitat may be found in any ecosite 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 linexliv, 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. Information Sources • In spring, local residents or landowners may have observed the emergence of snakes on their site (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) • SWHMISTcxlix Index #13 provides development effects and mitigation measures for snake hibernacula.	Studies confirming: • Presence of snake hibernacula used by a minimum of five individuals of a snake sp., or, individuals of two or more snake spp. • Congregations of a minimum of five individuals of a snake sp., or, individuals of two or more snake spp. near potential hibernacula (e.g. foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct)[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].	**Candidate SWH.** Suitable hibernation sites for snakes may be present throughout the study area where there are wetland habtiats, old foundations and wells, and wooded habitats.		
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Bank and Cliff)							
Rationale: Historical use and number of nests in a colony make this habitat significant. An identified colony can be very important to local populations. All swallow population are	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. Information Sources • 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.	**Not SWH.** Suitable bank and cliff habitat is not present in the study area.		
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs)							
Rationale: Large colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Great Blue Heron Black-crowned Night-Heron Great Egret Green Heron	SWM2 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1	• Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used. • Most nests in trees are 11 to 15 m from ground, near the top of the tree. Information Sources • 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 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.	**Not SWH.** Suitable deciduous or mized swamp habitat is not present in the study area.		

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	East A and East B Blocks	Central Block	West Block
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details		
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Ground)							
Rationale: Colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern Caspian Tern Brewer's Blackbird	Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1:50,000 NTS map). Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird) MAM1 – 6 MAS1 – 3 CUM CUT CUS	• Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas. • Brewers Blackbird colonies are found loosely on the ground in or in low bushes in close proximity to streams and irrigation ditches within farmlands. Information Sources • 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.	**Not SWH.** Rocky islands and peninsulas within lakes or large rivers are not present in the study area.		
Wildlife Habitat: Migratory Butterfly Stopover Areas							
Rationale: Butterfly stopover areas are extremely rare habitats and are biologically important for butterfly species that migrate south for the winter	Painted Lady Red Admiral Special Concern: Monarch	Combination of 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]. Information Sources • MNRF District Offices • Natural Heritage Information Centre (NHIC) • Agriculture Canada in Ottawa may have list of butterfly experts. • Field Naturalist Clubs • Toronto Entomologists Association	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, xliii]. • 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.	**Not SWH.** The study area is not within 5km of Lake Ontario or Lake Erie.		
Wildlife Habitat: Landbird Migratory Stopover Areas							
Rationale: Sites with a high diversity of species as well as high numbers are most significant	All migratory songbirds Canadian Wildlife Service Ontario website: http://www.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[l] 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]. Information Sources • 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[l]. 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.	**Not SWH.** The study area is not within 5km of Lake Ontario or Lake Erie.		

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	East A and East B Blocks	Central Block	West Block
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details		
Wildlife Habitat: Deer Winter Congregation Areas							
Rationale: Deer movement during winter in the southern areas of Ecoregion 7E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands to reduce or avoid the impacts of winter conditions [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]. Information Sources • MNRF District Offices • LIO/NRVIS	Studies confirm: • Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF[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.	**Not SWH.** Suitably-sized woodlots are not present within the study area. There are no winter congregation sites mapped by MNRF.		

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 7E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	East A and East B Blocks	Central Block	West Block
	ELC Ecosite Codes[1]	Habitat Description[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details		
Cliff and Talus Slopes							
Rationale: Cliffs and Talus Slopes are extremely rare habitats in Ontario.	Any ELC Ecosite within Community Series: TAO CLO TAS CLS TAT 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. Information Sources • The Niagara Escarpment Commission has detailed information on location of these habitats. • OMNRF Districts • Natural Heritage Information Centre (NHIC) has location information available on their website • Field naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Cliffs or Talus Slopes[lxxviii] • SWHMIST[cxlix] Index #21 provides development effects and mitigation measures.	**Not SWH.** Cliff and talus slopes are not present within the subject lands or surrounding study area.		
Sand Barrens							
Rationale: Sand barrens are rare in Ontario and support rare species. Most Sand Barrens have been lost due to cottage development and forestry.	ELC Ecosites: SBO1 SBS1 SBT1 Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always ≤ 60%.	Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by 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 Information Sources • 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)[l]. • SWHMIST[cxlix] Index #20 provides development effects and mitigation measures.	**Not SWH.** Sand barrens are not present within the subject lands or surrounding study area.		
Alvar							
Rationale: Alvars are extremely rare habitats in Ecoregion 7E	ALO1 ALS1 ALT1 FOC1 FOC2 CUM2 CUS2 CUT2-1 CUW2 **Five Alvar Indicator Species:** 1) Carex crawei 2) Panicum philadelphicum 3) Eleocharis compressa 4) Scutellaria parvula 5) Trichostema brachiatum These indicator species are very specific to Alvars within Ecoregion 7E[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]. Information Sources • 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.	**Not SWH.** Alvar communities are not present within the subject lands or surrounding study area.		

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 7E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	East A and East B Blocks	Central Block	West Block
	ELC Ecosite Codes[1]	Habitat Description[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details		
Old Growth Forest							
Rationale: Due to historic logging practices and land clearance for agriculture, old growth forest is rare in Ecoregion 7E.	Forest Community Series: FOD FOC FOM SWD SWC SWM	Old growth forests are characterized by heavy mortality or turnover of 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 Information Sources • 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.	**Not SWH.** Old growth forests and woodlands are not present within the subject lands or surrounding study area.		
Savannah							
Rationale: Savannahs are extremely rare habitats in Ontario.	TPS1 TPS2 TPW1 TPW2 CUS2	A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%. In Ecoregion 7E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario)[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. Information Sources • 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.	**Not SWH.** Savannah tallgrass prairie habitats are not present within the subject lands or surrounding study area.		
Tallgrass Prairie							
Rationale: Tallgrass Prairies are extremely rare habitats in Ontario.	TPO1 TPO2	A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover. In Ecoregion 7E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario)[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. Information Sources • 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[l]. 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.	**Not SWH.** Tallgrass prairie habitats are not present within the subject lands or surrounding study area.		

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 7E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	East A and East B Blocks	Central Block	West Block
	ELC Ecosite Codes[1]	Habitat Description[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details		
Other Rare Vegetation Communities							
Rationale: 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. Information Sources • 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.	**Not SWH.** Rare vegetation communities are not present within the subject lands or surrounding study area.		

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	East A and East B Blocks	Central Block	West Block
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details		
Wildlife Habitat: Waterfowl Nesting Area							
Rationale: Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant	American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard	All upland habitats located adjacent to these wetland 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[cxdix] 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[cxdix]. • 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. Information Sources • 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[j], or, • Presence of 10 or more nesting pairs for listed species including Mallards[j]. • 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.	**Not SWH.** Suitable wetland habitat is not present within East A and East B Blocks. No evidence of breeding was recorded for any listed species.	**Not SWH.** A suitable MAM2 wetland ecosite is present within the Central Block subject site. NRSI biologists incidentally observed a Mallard during 2018 field surveys. No evidence of breeding was recorded for any listed species.	**Candidate SWH.** Suitable MAM, MAS, and SAF wetland ecosites are rpesent in the West Block. Field surveys will be conducted to determine if SWH is present.
Wildlife Habitat: Bald Eagle and Osprey Nesting, Foraging and Perching Habitat							
Rationale: Nest sites are fairly uncommon in Ecoregion 7E and are used annually by these species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat.	Osprey Special Concern: Bald Eagle	ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands.	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.	**Not SWH.** Suitable woodland habitats adjacent to large water bodies or riparian zones are not present.		
Wildlife Habitat: Woodland Raptor Nesting Habitat							
Rationale: 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[lxxxviii, 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. Information Sources • 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.	**Not SWH.** Suitably-sized (>30ha) woodlots are not present within the study area.		

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	East A and East B Blocks	Central Block	West Block
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details		
Wildlife Habitat: Turtle Nesting Area							
Rationale: These habitats are rare and when identified will often be the only breeding site for local populations of turtles.	Midland Painted Turtle Special Concern: 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. Information Sources • Use Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels). • Check the Ontario Herpetofaunal Summary Atlas records or other similar atlases for uncommon turtles; location information may help to find potential nesting habitat for them. • 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[i] • 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.	**Not SWH.** Suitable exposed mineral soils (sand or gravel) adjacent or within 100m of suitable ecosites are not present.		**Candidate SWH.** Open areas with loose soils are present in the West Block; suitable turtle nesting habtiat may be present, particularly in the sand pits associated with the anturalizing golf course lands. Surveys are being completed in 2020.
Wildlife Habitat: Seeps and Springs							
Rationale: Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams	Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer 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]. Information Sources • 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[j] 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.	**Not SWH.** Suitable forested ecosites are not present. NRSI biologists have not encountered any seeps or springs during site visits completed to date.		
Wildlife Habitat: Amphibian Breeding Habitat (Woodland)							
Rationale: These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians.	• Presence of a wetland, pond or woodland pool (including vernal pools) >500m2 (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 habitatcxlviii. Information Sources • Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records • Local landowners may also provide assistance as they may hear spring-time choruses of amphibians on their site. • 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.	**Not SWH.** Several criteria species are reported from the vicinity of the study area. However, suitable forest ecosite habitats are not present.		
Wildlife Habitat: Amphibian Breeding Habitat (Wetland)							
Rationale: Wetlands supporting breeding for these amphibian species are extremely important and fairly rare within Central Ontario Landscapes	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	ELC Community Classes SW, MA, FE, BO, OA and SA. Typically these wetland ecosites will be isolated (>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. Information Sources • Ontario Herpetofaunal Summary Atlas (or other similar atlases) • Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count. • OMNRF Districts and wetland evaluations • Reports and other information available from 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[l]. • The ELC ecosite wetland area and the shoreline are the SWH. • A combination of observational study and call count surveys 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.	**Not SWH.** Several criteria species are reported from the vicinity of the study site, and suitable wetland habtiat is present. However, the results of anuran call surveys conducted by NRSI biologists in 2018 showed that thes candiate features did not meet the criteria for SWH.		**Candidate SWH.** Several criteria species are reported from the vicinity of the study site, and suitable wetland habtiat is present. Anuran call surveys conducted in 2020 will determine if SWH is present..

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	East A and East B Blocks	Central Block	West Block
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details		
Wildlife Habitat: Woodland Area-Sensitive Bird Breeding Habitat							
Rationale: Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest song birds.	Yellow-bellied Sapsucker Red-breasted Nuthatch Veery Blue-headed Vireo Northern Parula Black-throated Green Warbler Blackburnian Warbler Black-throated Blue Warbler Ovenbird Scarlet Tanager Winter Wren Pileated Woodpecker Special Concern: Cerulean Warbler Canada Warbler	All Ecosites associated with these 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]. Information Sources • Local birder clubs • Canadian Wildlife Service (CWS) for the location of forest bird monitoring • Bird Studies Canada conducted a 3-year study of 287 woodlands to determine the effects of forest fragmentation on forest birds and to determine what forests were of greatest value to interior species. • Reports and other information available from CAs	Studies confirm: • Presence of nesting or breeding pairs of 3 or more of the listed wildlife species[l]. • Note: any site with breeding Cerulean Warblers or Canada Warbler is to be considered SWH[l]. • 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"[cclxi] • SWHMIST[cxlix] Index #34 provides development effects and mitigation measures.	**Not SWH.** Several criteria species are reported from the vicinity of the study area. However, large mature woodlots >30ha in size are not present within the study area.		

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	East 'A' and 'B' Blocks	Central Block	West Block
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details		
Wildlife Habitat: Marsh Bird Breeding Habitat							
Rationale: Wetlands for these bird species are typically productive and fairly rare in Southern Ontario landscapes.	American Bittern Virginia Rail Sora Common Gallinule American Coot Pied-billed Grebe Marsh Wren Sedge Wren Common Loon Green Heron Trumpeter Swan Special Concern: Black Tern Yellow Rail	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SAS1 SAM1 SAF1 FEO1 BOO1 For Green Heron: All SW, MA and CUM1 sites	• Nesting occurs in wetlands • All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present[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. Information Sources • 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[f]. • Note: any wetland with breeding of 1 or more Trumpeter Swans, Black Terns, Green Heron or Yellow Rail is SWH[f]. • 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	**Candidate SWH.** Wetland habitat occurs within the subject sites and several listed species are reported from the vicinity of the study area. Marsh breeding bird surveys will be conducted by in 2020 to determine the presence of SWH.		
Wildlife Habitat: Open Country Bird Breeding Habitat							
Rationale: This wildlife habitat is declining throughout Ontario and North America. Species such as the Upland Sandpiper have declined significantly the past 40 years based on CWS (2004) trend records.	Upland Sandpiper Grasshopper Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow Special Concern: Short-eared Owl	CUM1 CUM2	Large grassland areas (includes natural and cultural fields and meadows) >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)[f]. Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older. The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species. Information Sources • Agricultural land classification maps Ministry of Agriculture • Local 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[f]. • 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	**Not SWH.** Large grassland areas >30ha in size are not present within the study area.		**Candidate SWH.** The naturalizing golf course provides ~35ha of CUM1 meadow habitat, part of which overlaps with the West Block. Breeding bird surveys are being completed in 2020 to determine if SWH is present..
Wildlife Habitat: Shrub/Early Successional Bird Breeding Habitat							
Rationale: This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined significantly over the past 40 years based on CWS (2004) trend records.	Indicator Spp: Brown Thrasher Clay-coloured Sparrow Common Spp. Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher Special Concern: Yellow-breasted Chat Golden-winged Warbler	CUT1 CUT2 CUS1 CUS2 CUW1 CUW2 Patches of shrub ecosites can be complexed into a larger habitat 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)[f]. 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. Information Sources • 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[f]. • A field with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat[f]. • 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.	**Not SWH.** Large natural field areas succeeding to shrub and thicket habitats >10ha in area are not present.		

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	East 'A' and 'B' Blocks	Central Block	West Block
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details		
Wildlife Habitat: Terrestrial Crayfish							
Rationale: 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. Information Sources • Information sources from "Conservation Status of Freshwater Crayfishes" by Dr. Premek Hamr for the WWF and CNF March 1998.	Studies Confirm: • Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable 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.	**Not SWH.** Wet meadows and the edges of shallow marshes are present within the East A and East B Blocks. Suitable MAM and SWD ecosites are also present however NRSI biologists did not observe any crayfish species' chimneys within suitable ecosites.		**Candidate SWH.** Wet meadows and the edges of shallow marshes are present within the West Block subject site. Suitable MAM ecosites are also present within or adjacent to the block. NRSI biologists to complete searches for terrestrial crayfish chimneys simultaneously with other field surveys throughout 2020/
Wildlife Habitat: Special Concern and Rare Wildlife Species							
Rationale: These species are quite rare or have experienced significant population declines in Ontario	All Special Concern and Provincially Rare (S1-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]. Information Sources • 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.	**Candidate SWH.** Several Species of Conservation Concern (SCC) and rare wildlife are reported from the study area. Of these species, only Grass Pickerel (*Esox americanus vermiculatus*) is considerd to have candidate spawning and nursery habitat in the study area. The off-site meadow marsh adjacent to the eastern boundary of the East B Block may proide habitat for this species.	**Not SWH.** Several Species of Conservation Concern (SCC) and rare wildlife are reported from the study area, however none of these species or their habitats were documented by NRSI biologists within the subject site during field surveys.	**Confirmed SWH.** Several Species of Conservation Concern (SCC) and rare wildlife are reported from the study area. 1 of these species, Snapping Turtle (*Chelydra serpentina*) has been robserved in the small pond in the southeastern corner of the West Block. Additional surveys will be completed in 2020 to determine if any other SCC or rare wildlife are present on site.

Table 5. Characteristics of Animal Movement Corridors for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	East A and East B Blocks	Central Block	West Block
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details		
Wildlife Habitat: Amphibian Movement Corridors							
Rationale: Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.	Eastern Newt American Toad 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]. Information Sources • 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.	**Not SWH.** Significant Amphibian Breeding Habitat (Wetland) is not present, therefore amphibian movement corridors do not require consideration.		**Candidate SWH.** Significant Amphibian Breeding Habitat (Wetland) is candidate in the West Block. Movement corridors to be assessed following completion of 2020 surveys.

Appendix IV
Central and East Blocks Tree Protection Plan

Upper West Side Urban Boundary Expansion

Central and East Blocks Tree Protection Plan

Prepared for:

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Project No. 1974E | February 2020

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Upper West Side Urban Boundary Expansion

Central and East Blocks Tree Protection Plan

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1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained by the Upper West Side Landowners Group (UWSLG, the "Client") to undertake a preliminary Tree Protection Plan (TPP) in conjunction with an Environmental Impact Study (EIS) for the proposed Urban Boundary Expansion (UBE) for 3 subject sites south of Twenty Road West in Hamilton, Ontario. The UWSLG is proposing the addition of 3 areas to the City of Hamilton's urban area lands classification. The subject sites are located directly south of Twenty Road West and are defined as 'Central', 'East A' and 'East B' blocks (Map 1).

In this report, the term 'subject sites' refers to the lands in the Central, East A, and East B blocks; these subject sites are approximately 32.0ha, 7.4ha, and 10.5ha, respectively. The present land uses of the subject sites include existing agricultural fields, a sod farm, unmanaged orchard areas, 1 inhabited and 2 abandoned residential properties with associated outbuildings and debris, and existing hedgerows. Some small areas of wetland and drainage features are present in the subject sites.

This preliminary TPP was conducted in accordance with the City of Hamilton's Tree Protection Guidelines (Appendix "A" to Report PD02229 (f) 2010). These guidelines state that if an owner wishes to destroy or injure a regulated tree, then the owner shall submit the information required in Part 2 of Appendix A, including a General Vegetation Inventory (GVI) and, at the request of the City, a TPP and Landscape Plan. Alternatively, the owner may elect to submit a TPP instead of the original GVI. This report has been prepared as a preliminary assessment of trees within the subject sites based on the latest Upper West Side Community Plan.

This report provides the findings of the tree inventory, analysis of preliminary development plans against the overall health and the structural integrity (referring to the potential for structural failure) of trees, protection measures for trees to be retained, and recommended mitigation and compensation measures. The tree data and mapping has been compared to the layout of the proposed Upper West Side Community Plan prepared by Corbett Land Strategies Inc. and shared with NRSI on February 25, 2020 (Map 2). This plan shows the proposed road network, land use types, and Natural Open Space. The existing overall health and/or potential for structural failure was compared to

the preliminary layout to determine whether existing trees would be impacted by the proposed undertaking. Avoidance, mitigation, and protection measures for trees are discussed to determine which trees would be impacted and which could be retained. In the case of trees requiring removal, compensation for removal is discussed. This preliminary TPP will be updated to reflect details provided for the subject sites at more detailed planning stages.

This report summarizes the following:

- findings of the tree inventory;
- assessment of overall health and potential for structural failure of inventoried trees;
- a preliminary tree retention analysis based on the layout of the proposed Upper West Side Community Plan;
- protection measures for trees to be retained; and
- recommended mitigation and compensation measures.

Final detailed tree removal, mitigation, compensation, and protection will be required once the site plan and grading plan are complete.

2.0 Tree Inventory and Methodology

The tree inventory conformed to the City's Tree Protection Guidelines (2010) and included all trees ≥10cm in diameter-at-breast-height (DBH) on and within approximately 3m of the subject sites, or with crowns overlapping the subject sites. This field work was completed by NRSI Certified Arborists on August 6, 9, 13, 16, 19, 20 and September 11, 17, 19, 2019. Individual trees that were ≥10cm in DBH were tagged with a pre-numbered aluminum forestry tag and assessed by a Certified Arborist; off-property and boundary trees were not tagged because they are not wholly the Client's property. Butternut trees (*Juglans cinerea*) also were not tagged because they are listed provincially and nationally as Endangered (OMNR 2019, COSEWIC 2011), and are protected under the *Endangered Species Act* (2007); tagging could be construed as doing harm to a Species at Risk (SAR). Trees that were not tagged were assigned an alpha-identifier to distinguish them on Map 2.

The locations of trees inventoried was surveyed using an SXBlue II GNSS GPS unit by the Certified Arborists and are shown on Map 2. A complete list of the 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 inventoried tree:

- Tag number (where applicable);
- Species (common and scientific name);
- DBH measurement (cm);
- Crown radius (m);
- General health (good, fair, poor, dead);
- Potential for structural failure (improbable, possible, probable, imminent);
- Tree location (e.g. subject site); and,
- General comments (i.e. disease, aesthetic quality, development constraints).

Section 5.0 of the City's Tree Protection Guidelines (2010) says that where a tree has more than 1 stem the DBH shall be presented as the total of the diameters of each stem.

When recording multi-stemmed specimens, NRSI measured the diameter of each stem >10cm DBH and summed the diameters to present total DBH.

The potential for structural failure was assessed based on the criteria outlined in Appendix II. The overall health of each inventoried tree was assessed based on the criteria outlined in the City's Tree Protection Guidelines (2010), as follows:

- **Good:** dead branches less than 10%; signs of good compartmentalization on any wounds, no structural defects.
- **Fair:** 10-30% dead branches, size or occurrence of wounds present some concerns, minor structural defects.
- **Poor:** more than 30% dead branches, weak compartmentalization, early leaf drop, presence of insects or disease, major structural defects.
- **Dead:** tree shows no signs of life.

In 2018, NRSI undertook a tree inventory and other environmental work on a parcel that abuts the Central and East A blocks. The trees inventoried there were reported on in the *Upper West Side Draft Plan of Industrial Subdivision: Tree Protection Plan* prepared by NRSI for the Twenty Road Landowners Group and submitted on June 12, 2018. The trees that are close to the boundaries between the present subject sites and the 2018 parcel are included in this report in order to demonstrate a fulsome inventory, and are differentiated on Maps 2A-2L, but are not included in the results and discussion of the current work. Trees inventoried in 2018 are addressed in detail under separate cover (NRSI 2018).

In carrying out these assessments, 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, including 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 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. None of the trees examined on the subject site 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.

2.1 Bat Habitat Assessment Methodology

Three (3) bat species reported from the area are listed as Endangered provincially and are afforded general habitat protection under the Endangered Species Act (2007). Bat SAR include Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), and Tri-colored Bat (*Perimyotis subflavus*).

Little Brown Myotis and Northern Myotis typically roost in tree cavities, hollows, under loose bark, and in buildings (MNR 2000; MNRF 2017). Tri-colored bat roosts in clusters of live or dead tree foliage in or below the canopy; Oak trees (*Quercus* spp.) are often preferred to other tree species, however, Maple trees (*Acer* spp.) are also thought to be important for roosting (MNRF 2017). As part of the tree health assessments, NRSI's Certified Arborists, who are trained and experienced in the Ministry of Natural Resources and Forestry (MNRF) bat habitat assessment protocol, visually scanned all trees ≥10cm DBH for the presence of cavities and other features that may provide bat maternity colony habitat, as per the protocols outlined in *Survey Protocol for Species at Risk Bats within Treed Habitats Little Brown Myotis, Northern Myotis & Tri-Colored Bat* (MNRF 2017). This protocol stipulates that surveys for Little Brown Myotis and Northern Myotis take place during the leaf-off season. Since tree inventory work took place in the leaf-on season, the assessment of suitable roost features was done as well as could be in the circumstances.

Information considered (and recorded, where applicable) for cavity trees included tree species, location, DBH, canopy cover, tree height, decay class (Watt and Caceres 1999), and number and height of potentially suitable cavities. Other criteria were also considered, including the use of cavities by other wildlife, the potential for cavities to be used by predators, supporting/surrounding habitat, and other characteristics which may contribute to the habitat requirements of these species, such as temperature regulation.

3.0 Tree Inventory Results

In total, 1,278 trees were inventoried in the subject sites in 2019, comprising 48 species. This diversity in species is due, in part, to the variety of areas inventoried: old orchard with natural regeneration, landscape trees around residential properties, naturalized hedgerows, and wetland. Of the trees inventoried and assessed, 1,081 (84.5%) are native species and 194 (15.2%) are non-native; an additional 3 trees could not be identified because of their advanced state of decay. Nearly one-third (28%) of all trees inventoried in 2019 were Black Walnut (*Juglans nigra*); the next most frequently occurring were Hawthorn species (*Crataegus* spp., 14%) and Sugar Maple (*Acer saccharum* ssp*. saccharum*, 8%). More than half of all trees inventoried were in fair condition. Table 1 describes the number of native and non-native trees inventoried from each of the subject sites.

Table 1. Inventoried Trees by Subject Site

	Central	East A	East B	Total
Native	694	154	236	1,084
Non-native	99	79	16	194
Total	**793**	**233**	**252**	**1,278**

Around the house at the northwest corner of the Central block there are 2 hedgerows of Eastern White Cedar (*Thuja occidentalis*). The hedgerow in the front yard contains 21 trees and the hedgerow in the back yard contains 15 trees. Because of their relative uniformity, the trees in these hedgerows were not inventoried as individuals but their collective driplines were recorded using the SXBlue II GNSS GPS unit and general comments were made.

The method of presenting DBH, as discussed in Section 2.0, resulted in some very large diameters, with 36 multi-stemmed trees having a total DBH of >100cm.

A complete list of inventoried trees is provided in Appendix I and tree locations within the subject sites are shown on Maps 2A-2O.

3.1 Butternuts

More than 150 Butternuts have been identified to date across the wider Upper West Side Landowners' block; only 14 of these are within the present Urban Boundary Expansion subject sites. Qualified Butternut Health Assessors (BHAs) at NRSI have conducted health assessments on many of these, though some were located after August 31st, the date denoting the end of the leaf-on season when full health assessments can be completed (Government of Ontario 2014), and have not yet been assessed. Across the subject sites of this report, 9 Butternuts have had health assessments completed and an additional 5 remain to be assessed. A BHA Report has not yet been submitted. Butternut trees of any size are protected under the *Endangered Species Act*, 2007, and associated O.Reg. 242/08; some of the Butternuts present on the subject sites are <10cm DBH and so do not appear in the tree inventory data. Seven (7) Butternuts >10cm DBH are incorporated into the tree inventory data. More information on Butternut trees as SAR is found in section 4.6.1 of the *Upper West Side UBE: Central and East Blocks Environmental Impact Study and Linkage Assessment* (NRSI 2020).

3.2 Tree Cavity Assessment Findings

A total of 25 trees were identified throughout the subject sites as having cavities or other features that may provide bat maternity colony habitat for SAR bats and are shown on Maps 2A-2O. Eight (8) of these are Maple or Oak trees with dead leaf clusters, which are favoured by Tri-colored Bats for roosting, while the remaining 17 trees have cavities, cracks, loose bark, or other features that are favoured by Little Brown Myotis and Northern Myotis for roosting. Further study and consultation with MECP may be required in order to address potential impacts to SAR bats from the proposed development. Potential tree removals and mitigating actions will need to be determined at a later stage.

4.0 Tree Removal and Retention Analysis

Tree removal and retention was based on 2 considerations:

1) Trees identified as having a probable potential for structural failure, or in poor health or identified as dead. The removal of these trees may be recommended for safety etc., especially if they are located within striking distance of a component of the proposed development, or existing off-site sidewalks, roads, or buildings.
2) Trees that require removal based on the extent of proposed roadways. Given that details within each development block have not yet been provided, the analysis of impacts was based on areas of known tree removals (i.e. the proposed road network). This was determined by comparing the location of trees to the location of the components of the development proposal as shown on Map 2.

Tree removal will require further analysis at more detailed planning stages and will require more removals than are outlined here. A more detailed analysis at that time will require approval from the City before any on-site activity that may impact the trees is permitted to occur. At this time, 60 of the 1,278 inventoried trees are anticipated to be removed. This includes 9 trees that have a probable potential for structural failure, and an additional 1 tree in poor health with a possible potential for structural failure and proximity to proposed roadways. These have been identified in Appendix I as having 'Condition' as the rationale for removal.

The remaining 51 trees require removal based on the extent of the proposed roadways. This includes trees situated along the road layout or in close proximity that may incur serious root damage as a result of grading. Most of these trees are in good to fair health with a possible to improbable potential for structural failure, and range in size from 11.8cm to 426.0cm summed diameter. Approximately 82% of these trees are native and are dominated by Hawthorn species, Black Walnut, and Manitoba Maple (*Acer negundo*). None of the trees identified as having cavities or other features that maybe provide bat maternity colony habitat for SAR bats are recommended for removal at this preliminary stage.

5.0 Tree Compensation Plan

The City of Hamilton Tree Protection Guidelines (2010) state that:

> *"to ensure existing tree cover is maintained, the City requires 1 for 1 compensation for any trees to be removed. If it is not possible to replant trees on site (i.e. no space), Cash-in-lieu will be provided to the City to plant trees elsewhere. Where compensation planting is required, credit will be given for street trees planted, as required under a Subdivision Agreement".*

Trees requiring removal may be considered for transplant viability elsewhere in the subject sites. It is recommended that dead trees and those with a probable or imminent potential for structural failure be considered exempt from compensation.

Table 2 provides a summary of the trees inventoried throughout the subject sites, total number proposed for removal in this preliminary analysis, and a compensation plan pursuant to the preliminary analysis. A complete list of inventoried trees, including a determination of whether trees require compensation, is provided in Appendix I.

Table 2. Summary of Trees to be Removed and Recommended Compensation Plan

Tree Inventory	**Total**
Total number of trees inventoried	1,278
Preliminary number of trees to be removed	60
Tree Compensation	
Dead trees and/or those with a probable potential for structural failure (exempt from compensation)	9
Remaining trees to be removed	51
1:1 Compensation for qualifying trees to be removed	**51**

Compensation plantings may be provided natural heritage system (NHS) buffers along water courses, ponds, or headwater drainage features, within buffers applied to existing woodlands, and elsewhere on the UWSLG block. The City of Hamilton will give credit for street trees planted towards compensation requirements (City of Hamilton 2010); another element of the proposed development that may be a suitable place for compensation plantings is around any stormwater management ponds, following further conversations with the Client and City.

6.0 Tree Protection Measures and Recommended Mitigation

Mitigation and tree protection measures will require detailed analysis and planning, with correspondence and final approval from the City of Hamilton prior to any construction activity near any trees. Detailed grading and site plans will be required to complete a detailed retention analysis and Tree Protection Fencing (TPF) plan. Recommendations on TPF locations, standards, and protocols are outlined below, and should be followed during the final detailed analysis.

6.1 Prior to Construction

Temporary TPF will be situated where trees are adjacent to the limit of disturbance and/or grading; a combined sediment and erosion control fence (i.e. silt fence) and tree protection fence is recommended. The TPF is to take the form of 1200mm high paige-wire fencing at a minimum 1 metre from the dripline, 360° around the tree (City of Hamilton 2010). For information on sediment and erosion control, stormwater management, anticipated construction impacts, and other construction mitigation not directly connected to tree management and protection, refer to the *Upper West Side Urban Boundary Expansion Central and East Blocks Environmental Impact Study and Linkage Assessment* (NRSI 2020).

The TPF will be installed and maintained by the Client and/or their agents. Prior to any construction activities (rough grading, vegetation, and tree removal), the TPF will be installed at the limit of the associated buffer of trees to be retained to protect the stems and root systems. Prior to works commencing on-site, the location of fence installation is to be inspected by a tree management professional, as defined in the City of Hamilton Guidelines (2010). Signs indicating the purpose of the fencing are to be posted in a manner that they are visible from all angles.

This TPP, as well as the pending detailed removal and protection following detailed grading and site plan design, is to be reviewed and approved by the City of Hamilton. Upon approval of the TPP, and prior to any on-site works (i.e. rough grading, tree removal), a qualified tree management professional is to submit written verification to the City that all the recommended tree protection measures have been installed in accordance with the TPP in the form of a Verification of Tree Protection Letter. Prior to

this final authorization, a site inspection will be performed to determine any deficiencies that may exist and recommend corrective measures to be followed.

A security deposit to the City in the form of cash or acceptable letter of credit is required before this TPP will be accepted. The amount of this deposit will be determined through consultation with City staff. Once the consultant certifies that the TPP measures have been implemented appropriately, 75% of the deposit will be released, following the submission of the Post-Grading Tree Maintenance Report (City of Hamilton 2010). The remaining 25% of the security deposit will be held for a 2-year maintenance period to ensure the survival of remaining trees. If trees to be retained do not survive this 2-year period, a portion of this deposit may not be refunded.

6.1.1 Migratory Birds Convention Act

The removal of trees within the subject sites has the potential to disrupt nesting birds. The Migratory Birds Convention Act (MBCA, Government of Canada 1994) identifies a list of migratory bird species that are protected. It prohibits the destruction of nests, individuals and activities that would cause an adult bird to abandon a nest. Tree removal is to occur outside of the core nesting period for migratory birds as established by the Canadian Wildlife Service (CWS 2012) which extends from approximately April 1 through August 31. Every developer/consultant/contractor, etc. is legally obliged to carry out due diligence to protect migratory birds from harm during all construction projects.

Historically, the implementation policies of the MBCA provided for biologists to conduct nest searches when vegetation removals were to occur during the nesting period. These provisions were revoked in 2014. One exception is for when the removals are to occur in simple habitats which are characterized in the MBCA (e.g. bridge structures, isolated trees, vacant lot). Parts of the subject sites (e.g. hedgerows) might be classified as ‘simple habitat’. Should tree removal be required to occur within the peak breeding window, pending discussion and approval by the CWS, nest surveys may be conducted by a qualified biologist just prior to the removal activity (less than 48 hours prior to) to ensure that nesting birds are not present. Should a nest be identified within a tree(s) to be removed, the tree shall be protected with a buffer and there shall be no removal or construction activity within that area until sign-off is obtained from the qualified biologist that the nest is no longer active. Trees identified as having no nesting activity can be

removed; however, tree removal is to occur within 48 hours of the nest search. If tree removal does not occur within this time frame, additional nest searches are to be conducted.

In the event a nest survey is conducted, a clearance letter is to be prepared by the qualified biologist that undertook the surveys and submitted to the City for their files in the event a record of due diligence is requested by CWS.

6.1.2 Bat Active Window

MECP staff have indicated that the period of greatest bat activity in the vicinity of the subject sites is between April 1-September 30. In order to avoid potential impacts to SAR bats and their maternity colony habitat, tree removals should take place during the period of October 1-March 31. At this preliminary stage none of the inventoried trees reported to have suitable habitat features are recommended for removal but this will need to be revisited when more project details are known.

6.2 During Construction

Temporary TPF is to be maintained by the Client and/or their agents during the entire construction period to ensure that trees being retained and their root systems are protected. All workers should be informed of all tree protection requirements outlined in this report. Within this area there must be no construction, no alteration of grades, no storage of materials or disposal of liquids, no movement or parking of vehicles or equipment, or any other activity that might compress or otherwise impact soil conditions. Any minimal damage (i.e. damage to limbs or roots) to trees to be retained during construction must be pruned using proper arboricultural techniques. Should any of the trees intended to be retained be seriously damaged or die as a result of construction activities, the owner will remove and replace the tree at their own expense at a 1:1 ratio.

6.3 Post-Construction

As many trees being retained are likely to be situated along the boundaries of the proposed development, it is recommended that the temporary TPF be removed upon completion of construction activities and adjacent areas are stabilized with a vegetative cover (i.e. sod or native vegetation as required) to the satisfaction of the Environmental Inspector or qualified biologist. Where retained trees are situated along natural features,

such as headwater drainage features and wetlands, appropriate Vegetation Protection Zones (VPZs) have been identified. A discussion of the VPZs is available in the Upper West Side Urban Boundary Expansion Central and East Blocks Environmental Impact Study and Linkage Assessment (NRSI 2020).

Replacement species are to be reviewed by a Landscape Architect as part of a Landscape Plan, as described in Section 7.4 (City of Hamilton 2010). Watering and pruning of newly planted trees will be carried out by the owner/contractor as required during the warranty period (approximately 2 years). After grading has been completed, the City requires that a Post-Grading Tree Maintenance Report be submitted to the Director of Planning outlining the following (City of Hamilton 2010):

- Assessment of damage or removal of trees to be retained;
- A dollar value for damaged trees and a corresponding compensation plan; and
- Preservation recommendations such as crown and root fertilization, watering and pruning to improve the health of remaining trees.

6.4 Mitigation

The recommendations provided below are aimed at protecting retained trees and associated natural features. Species used for replacement/enhancement plantings should be native to the City of Hamilton wherever possible and not include any species that are listed as introduced. Trees may be transplanted instead of replaced where feasible. The use of hardy species will ensure successful early establishment and minimize the potential for invasive species proliferation.

A Landscape Plan is to be prepared by or under the guidance of a Landscape Architect in good standing with the Ontario Association of Landscape Architects (OALA) and submitted to the Director of Planning for City staff review and approval. This is to include proposed plantings, maintenance methods, and landscape features, as explained in the City of Hamilton Tree Protection Guidelines (2010). Attention should be given to the policies of the Forestry and Horticulture Section of Public Works Department, Operations and Maintenance Division titled “City of Hamilton Street Tree Planting Policy—New Developments” and “City of Hamilton Street Tree Planting Policy—Planning and Design”.

At the detailed design stage, it is recommended that the following criteria be followed during the design and installation of planting plans:

- Recommended species for planting are outlined in Appendix 4 of the City of Hamilton Tree Protection Guidelines (2010); plantings should not include any of the invasive species listed in Appendix 5 of the same document;
- Use drought-resistant plant material to conserve water and reduce long-term maintenance;
- The minimum size for deciduous planting stock is 50mm caliper;
- The minimum height for a conifer is 1.5 metres;
- Include a mix of tree species (no monocultures);
- Tree species to be situated near roads should be salt tolerant;
- Trees should come from Ontario nursery stock to avoid introduction of new pathogens, and undesirable genotypes;
- Avoid Ash species (*Fraxinus* spp.) due to the risk of the Emerald Ash Borer (*Agrilus planipennis*);
- Avoid 'messy trees', such as fruiting trees or Poplar species (*Populus* spp.) where plantings occur near driveways and roadways;
- All plant material is to conform to the latest edition of the Canadian Nursery Trades Association specifications and standards;
- Plantings installed as per specifications outlined in landscape plan to be prepared by or under the guidance of a landscape architect in good standing with the OALA (e.g. place mulch of a natural material to a minimum depth of 10cm around all planted material);
- Spacing of plant material should account for the ultimate size and form of the selected species and the purpose of the planting, whether it be for screening, shade, naturalizing, rehabilitation, etc.;
- Special attention to location and height of trees in proximity to utilities; and
- Ensure that there is sufficient soil volume for all plantings.

7.0 References

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Appendix I

Upper West Side Urban Boundary Expansion Central and East Blocks – Tree Inventory Data

Upper West Side Urban Boundary Expansion- Central and East Blocks
Appendix I: Tree Inventory Data

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Location	Proposed Action	Rationale for Removal	Compensation Required	Comments
2001	Black Walnut	*Juglans nigra*	Native	1	10.3	2.0	Improbable	Good	East B	Retain			Codominant leaders from 1m; healthy crown extends nearly to ground.
2002	White Elm	*Ulmus americana*	Native	1	17.4	2.5	Improbable	Fair	East B	Retain			Heavy, extensive vines; suppressed from vines.
2003	Sweet Cherry	*Prunus avium*	Non-Native	1	31.5	3.5	Improbable	Good	East B	Retain			Corrected lean; full crown; vine heavy in crown.
2004	Sweet Cherry	*Prunus avium*	Non-Native	1	17.4	3.0	Improbable	Fair	East B	Retain			Vines in crown; intertwined stems.
2005	Sweet Cherry	*Prunus avium*	Non-Native	1	14.0	3.0	Improbable	Fair	East B	Retain			Vines in crown; intertwined stems.
2006	Hawthorn species	*Crataegus sp.*	Native	1	10.3	2.5	Improbable	Fair	East B	Retain			Broad crown slightly suppressed; leaf spots; single-stemmed with water sprouts; vine in crown.
2007	Sweet Cherry	*Prunus avium*	Non-Native	1	43.6	4.0	Improbable	Fair	East B	Retain			Closed vertical seam; vines.
2008	Manitoba Maple	*Acer negundo*	Native	2	27.0	2.5	Improbable	Fair	East B	Retain			2 main stems with other basal shoots; epicormic growth; full crown, with vines.
2009	Sweet Cherry	*Prunus avium*	Non-Native	1	12.7	2.0	Improbable	Fair	East B	Retain			Dense vines; small crown.
2010	White Elm	*Ulmus americana*	Native	1	41.0	3.0	Improbable	Fair	East B	Retain			Dense vines; small crown.
2011	Honey Locust	*Gleditsia triacanthos*	Native	2	111.0	8.0	Possible	Good	East B	Retain			Stems fused, included bark; secondary stem suppressed and crossing; open bark rubbing wound; large scaffold branches; good fruit set; dead lower branches.
2012	Honey Locust	*Gleditsia triacanthos*	Native	1	55.8	4.0	Possible	Fair	East B	Retain			Sharply leaning east; base swollen with reaction wood; phototrophic growth, bends in branches; fence wire through stem; minor thinning and epicormic growth.
2013	Hawthorn species	*Crataegus sp.*	Native	1	11.0	3.0	Improbable	Fair	East B	Retain			Slightly suppressed; branch union wounds; minor dieback; minor water sprouts.
2014	Hawthorn species	*Crataegus sp.*	Native	1	11.4	3.0	Improbable	Fair	East B	Retain			Slightly suppressed; branch union wounds; minor dieback; minor water sprouts.
2015	Honey Locust	*Gleditsia triacanthos*	Native	1	39.9	4.0	Improbable	Fair	East B	Retain			Large dead branches; slightly unbalanced; minor vines.
2016	White Elm	*Ulmus americana*	Native	1	17.0	2.0	Improbable	Fair	East B	Remove	Street B	Yes	Vines; slightly suppressed; minor light pruning.
2017	Black Cherry	*Prunus serotina*	Native	1	34.6	5.5	Possible	Fair	East B	Retain			Crooked stem leaning east; 1 dead scaffold branch; epicormic growth.
2018	Black Cherry	*Prunus serotina*	Native	1	33.9	3.5	Probable	Poor	East B	Remove	Condition	Yes	Large dead branches; epicormic growth; major rot.
2019	Honey Locust	*Gleditsia triacanthos*	Native	1	79.0	8.5	Possible	Fair	East B	Retain			Large codominant stems from 1m; heavily thorned; couple dead scaffold branches; crown thinning.
2020	Honey Locust	*Gleditsia triacanthos*	Native	1	31.0	3.0	Improbable	Fair	East B	Retain			Slightly suppressed; broken main stem with reacted lateral leader.
2021	Black Cherry	*Prunus serotina*	Native	1	40.0	4.0	Improbable	Fair	East B	Retain			Dead branches; slightly unbalanced.
2022	Honey Locust	*Gleditsia triacanthos*	Native	1	69.3	5.0	Improbable	Fair	East B	Retain			Large root flare with old open wound; appears to be from old broken limb; large dead branch with healthy upper crown.
2023	Honey Locust	*Gleditsia triacanthos*	Native	1	74.7	6.0	Improbable	Fair	East B	Retain			Light pruning; minor dieback.
2024	Honey Locust	*Gleditsia triacanthos*	Native	1	32.7	3.5	Possible	Poor	East B	Retain			Arching lean, sharply crooked stem; history of significant branch failure; dead branches; water sprouts.
2025	Hawthorn species	*Crataegus sp.*	Native	2	22.0	3.0	Improbable	Fair	East B	Retain			Included bark; vigorous basal shoot; crossing branches; leaf spots.
2026	Hawthorn species	*Crataegus sp.*	Native	1	12.4	2.0	Improbable	Fair	East B	Retain			Large open wound at base from missing main stem; unbalanced; broken branches.
2027	Hawthorn species	*Crataegus sp.*	Native	3	58.0	2.5	Improbable	Fair	East B	Retain			Codominant leaders; included bark; dieback; vines.
2028	Common Apple	*Malus domestica*	Non-Native	3	80.0	4.0	Possible	Poor	East B	Retain			Codominant stems spreading from base; 1 stem dead; sapwood and heartwood decay; vines through crown.
2029	Tree-of-Heaven	*Ailanthus altissima*	Non-Native	1	20.8	2.0	Improbable	Good	East B	Retain			Healthy open crown; minor epicormic growth; small sooty wounds.
2030	Manitoba Maple	*Acer negundo*	Native	2	32.0	3.0	Improbable	Fair	East B	Retain			Dieback; water sprouts; codominant leaders.
2031	Manitoba Maple	*Acer negundo*	Native	1	16.9	3.0	Possible	Fair	East B	Retain			Codominant leaders with included bark; basal shoots; vine in crown; full crown.
2032	Staghorn Sumac	*Rhus typhina*	Native	1	19.3	2.5	Possible	Poor	East B	Remove	Condition	Yes	Major dieback; major damage to stem; vines.
2033	Staghorn Sumac	*Rhus typhina*	Native	1	19.8	4.0	Improbable	Fair	East B	Retain			Leaning west; vines; dieback.
2034	White Elm	*Ulmus americana*	Native	1	15.2	3.0	Improbable	Fair	East B	Retain			Minor vines; stem rub with sumac.
2035	Crack Willow	*Salix fragilis*	Non-Native	2	45.0	2.5	Possible	Fair	East B	Retain			Fine branching, decent structure; significant foliar necrosis.
2036	Crack Willow	*Salix fragilis*	Non-Native	1	20.8	2.5	Possible	Fair	East B	Retain			Crooked stem; minor dieback; significant foliar necrosis.
2037	Black Willow	*Salix nigra*	Native	1	34.8	5.0	Improbable	Good	East B	Retain			Minor light pruning; healthy crown.
2038	Manitoba Maple	*Acer negundo*	Native	1	11.5	2.5	Improbable	Fair	East B	Retain			Irregular crown with vines throughout.
2039	White Elm	*Ulmus americana*	Native	1	13.2	2.5	Improbable	Fair	East B	Retain			Vines in canopy; healthy crown.
2040	White Elm	*Ulmus americana*	Native	1	18.5	3.0	Improbable	Good	East B	Retain			Major vines; healthy canopy.
2041	Staghorn Sumac	*Rhus typhina*	Native	1	10.5	2.0	Improbable	Poor	East B	Retain			Suppressed crown under extensive vines.
2042	Manitoba Maple	*Acer negundo*	Native	3	59.0	5.0	Possible	Good	East B	Retain			Included bark; full crown; exposed roots; epicormic growth; heavy fruit set.
2043	Manitoba Maple	*Acer negundo*	Native	1	18.9	3.5	Improbable	Fair	East B	Retain			Included bark; epicormic growth; minor dieback.
2044	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	58.2	8.0	Improbable	Good	East B	Retain			Dead branch; otherwise very healthy crown.
2045	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	58.4	8.0	Improbable	Fair	East B	Retain			Small remaining crown; minor lean north.
2046	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	72.9	8.5	Possible	Fair	East B	Retain			Large stem with pronounced bend; centre rot; asymmetrical crown to the east; swing on low scaffold branch; some epicormic growth.
2047	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	46.8	6.0	Improbable	Fair	East B	Retain			Minor dead and broken branches; relatively healthy crown.
2048	Small Leaf Linden	*Tilia cordata*	Non-Native	2	22.0	2.0	Improbable	Fair	East B	Retain			Vines; codominant leaders; included bark.

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Location	Proposed Action	Rationale for Removal	Compensation Required	Comments
2049	American Basswood	*Tilia americana*	Native	2	52.0	4.0	Improbable	Good	East B	Retain			Codominant stems with included bark; strong leaders; vine in crown; minor insect defoliation.
2050	Eastern Cottonwood	*Populus deltoides*	Native	1	13.2	2.5	Improbable	Good	East B	Retain			No apparent problems.
2051	American Basswood	*Tilia americana*	Native	1	57.0	1.0	Probable	Dead	East B	Remove	Condition	No	Large stem with advanced brown rot; shedding bark; horizontal cracks through decay.
2052	American Basswood	*Tilia americana*	Native	4	126.0	6.5	Improbable	Good	East B	Retain			Codominant stems, some crossing; included bark; some epicormic growth.
2054	Common Apple	*Malus domestica*	Non-Native	4	67.0	3.5	Improbable	Fair	East B	Retain			Poor form and structure; epicormic growth; light pruning.
2055	Honey Locust	*Gleditsia triacanthos*	Native	1	64.5	5.5	Improbable	Fair	East B	Retain			Very minor dieback; included bark; broken branches; healthy crown.
2056	Honey Locust	*Gleditsia triacanthos*	Native	1	47.1	6.0	Possible	Fair	East B	Retain			History of branch failures; leaning south.
2057	Honey Locust	*Gleditsia triacanthos*	Native	1	44.2	6.0	Improbable	Fair	East B	Retain			Small dead branches; minor dieback; tight crowns; asymmetrical crown to north.
2058	Honey Locust	*Gleditsia triacanthos*	Native	1	49.3	6.5	Improbable	Fair	East B	Retain			Girdling by cable at 3m; water sprouts below; asymmetrical crown to south.
2059	Honey Locust	*Gleditsia triacanthos*	Native	1	58.6	7.0	Improbable	Fair	East B	Retain			Strong central stem; 5% live crown lost; light pruning.
2060	Norway Spruce	*Picea abies*	Non-Native	1	60.4	6.0	Improbable	Good	East B	Retain			Dieback; larger branches east.
2061	Honey Locust	*Gleditsia triacanthos*	Native	1	43.7	6.0	Possible	Fair	East B	Retain			Arching north; 2 dead branches; crooked branches, history of branch failure.
2062	Honey Locust	*Gleditsia triacanthos*	Native	1	34.0	5.5	Improbable	Fair	East B	Retain			Tightly planted; dead branches; crown slightly to southeast.
2063	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	2	11.8	2.5	Improbable	Fair	East B	Retain			Suppressed crown; crown bound up with neighbors and branches crossing; abutted with adjacent Honey Locust.
2064	Honey Locust	*Gleditsia triacanthos*	Native	1	58.6	7.5	Possible	Fair	East B	Retain			Major dieback; large dominant crown.
2065	Honey Locust	*Gleditsia triacanthos*	Native	1	29.0	4.0	Improbable	Good	East B	Retain			1 dead scaffold branch; phototrophic growth, irregular crown.
2066	Honey Locust	*Gleditsia triacanthos*	Native	1	30.7	3.5	Improbable	Fair	East B	Retain			Upright stem; crown slightly suppressed; epicormic growth.
2067	Honey Locust	*Gleditsia triacanthos*	Native	1	61.9	8.0	Improbable	Good	East B	Retain			Arching slightly north; lower stem wound nearly closed; minor dieback; gypsy moth with egg sac.
2068	Honey Locust	*Gleditsia triacanthos*	Native	1	41.4	6.0	Improbable	Fair	East B	Retain			Small dead branches; tightly planted.
2069	Honey Locust	*Gleditsia triacanthos*	Native	1	35.6	4.5	Improbable	Good	East B	Retain			Healthy crown; minor dieback.
2070	Honey Locust	*Gleditsia triacanthos*	Native	1	44.8	5.0	Possible	Fair	East B	Retain			Large dead branches; leaning north; broken branches.
2071	Honey Locust	*Gleditsia triacanthos*	Native	1	39.0	5.0	Possible	Fair	East B	Retain			Sharply crooked stem leans south; broken leader; water sprouts.
2073	Honey Locust	*Gleditsia triacanthos*	Native	1	71.0	8.0	Improbable	Good	East B	Retain			4 stems arise at 1.5m; included bark; minor dieback; epicormic growth.
2074	Honey Locust	*Gleditsia triacanthos*	Native	1	50.8	6.0	Improbable	Fair	East B	Retain			Large and small dead branches; codominant leaders; open wound near base with frass.
2075	Honey Locust	*Gleditsia triacanthos*	Native	1	38.4	4.0	Improbable	Fair	East B	Retain			Very straight; tall crown; tightly planted; minor dieback.
2076	Honey Locust	*Gleditsia triacanthos*	Native	1	28.9	6.0	Possible	Fair	East B	Retain			Flat side of root flare, potential root rot; 1 dead scaffold branch; light pruning.
2077	Honey Locust	*Gleditsia triacanthos*	Native	1	40.5	6.0	Improbable	Fair	East B	Retain			Large lateral south; minor epicormic growth; tightly planted.
2078	Honey Locust	*Gleditsia triacanthos*	Native	1	77.8	7.5	Improbable	Good	East B	Retain			2 broken branches; included bark with secondary stem; healthy crown; dead lower branches.
2079	Black Walnut	*Juglans nigra*	Native	1	12.5	2.5	Improbable	Good	East B	Retain			Minor vines; very minor defoliation.
2080	Black Walnut	*Juglans nigra*	Native	1	14.4	3.0	Improbable	Fair	East B	Retain			Major vines.
2081	Black Walnut	*Juglans nigra*	Native	1	12.0	3.0	Improbable	Fair	East B	Retain			Major vines; included bark from very close stems.
2082	Norway Maple	*Acer platanoides*	Non-Native	4	72.0	3.5	Improbable	Good	East A	Retain			Codominant leaders; minor light pruning; epicormic growth.
2083	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	74.3	7.5	Improbable	Good	East A	Retain			1 dead leader with centre rot; very minor dieback.
2084	Freeman's Maple	*Acer X freemanii*	Native	5	82.0	3.0	Improbable	Fair	East A	Retain			Codominant stems from base; minor dieback.
2085	Staghorn Sumac	*Rhus typhina*	Native	1	10.3	2.5	Improbable	Fair	East A	Retain			Leaning east; minor dieback.
2086	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	76.8	5.5	Improbable	Fair	East A	Retain			Exfoliating bark; sapwood rot; exit holes; included bark; one dead top; minor dieback; large open cavity.
2087	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	39.2	1.5	Probable	Dead	East A	Remove	Condition	No	Dead top; fruiting bodies.
2088	Red Oak	*Quercus rubra*	Native	1	31.1	4.5	Improbable	Good	East A	Retain			Strong leader; good structure; vine in crown.
2089	Sweet Cherry	*Prunus avium*	Non-Native	1	28.6	3.0	Improbable	Fair	East A	Retain			Heavy vines in crown; crown itself is healthy.
2090	Silver Maple	*Acer saccharinum*	Native	1	24.8	4.5	Improbable	Good	East A	Retain			Vigorous branch growth; vine up stem.
2091	Black Cherry	*Prunus serotina*	Native	1	14.2	2.0	Improbable	Fair	East A	Retain			Vines; crown slightly to east.
2092	Black Cherry	*Prunus serotina*	Native	2	11.0	2.0	Improbable	Fair	East A	Retain			Few dead branches; vine in suppressed crown.
2093	Black Cherry	*Prunus serotina*	Native	1	10.3	1.0	Possible	Poor	East A	Retain			Topped; vines; rot.
2094	Black Cherry	*Prunus serotina*	Native	1	15.7	2.0	Possible	Fair	East A	Retain			Few dead lower branches; included bark; vine in crown.
2095	Sweet Cherry	*Prunus avium*	Non-Native	2	30.0	3.0	Improbable	Fair	East A	Retain			Minor included bark; minor dieback; minor lean south.
2096	Norway Maple	*Acer platanoides*	Non-Native	2	29.0	3.0	Improbable	Fair	East A	Retain			Epicormic growth; codominant leaders.
2097	Sweet Cherry	*Prunus avium*	Non-Native	1	11.5	2.0	Improbable	Good	East A	Retain			Asymmetrical crown due to neighbouring trees.
2098	Common Apple	*Malus domestica*	Non-Native	1	31.8	5.0	Improbable	Fair	East A	Retain			Dieback; light pruning.
2099	Sweet Cherry	*Prunus avium*	Non-Native	1	26.5	5.0	Improbable	Fair	East A	Retain			Minor dieback; closed vertical seam.
2100	Bur Oak	*Quercus macrocarpa*	Native	1	22.1	4.0	Improbable	Good	East A	Retain			Vine in crown; epicormic growth.
2101	Hawthorn species	*Crataegus sp.*	Native	1	14.0	2.5	Improbable	Fair	East A	Retain			Slightly suppressed; minor dieback; minor lean east.
2102	Hawthorn species	*Crataegus sp.*	Native	1	19.1	3.0	Improbable	Good	East A	Retain			Dense, crossing branches; vine in crown, slightly suppressed.
2103	Hawthorn species	*Crataegus sp.*	Native	2	29.0	3.0	Possible	Poor	East A	Retain			Rot at base; epicormic growth; light pruning.
2104	Sweet Cherry	*Prunus avium*	Non-Native	1	42.0	3.0	Improbable	Fair	East A	Retain			Codominant leaders; included bark small dead branches.
2105	Hawthorn species	*Crataegus sp.*	Native	2	12.6	2.5	Improbable	Fair	East A	Retain			Vigorous upward growth; twisting stems.
2106	Hawthorn species	*Crataegus sp.*	Native	2	49.0	4.5	Improbable	Good	East A	Retain			Codominant stems with included bark; twisting branches.
2107	Sweet Cherry	*Prunus avium*	Non-Native	1	14.6	3.0	Improbable	Fair	East A	Retain			Minor vines; thin crown.
2108	Sweet Cherry	*Prunus avium*	Non-Native	1	22.2	4.0	Possible	Fair	East A	Retain			Leaning east; few dead branches; gummosis; vine in crown.
2109	Sweet Cherry	*Prunus avium*	Non-Native	1	21.0	4.0	Possible	Fair	East A	Retain			Leaning heavily east; basal rot; misshapen root flare; healthy crown.

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Location	Proposed Action	Rationale for Removal	Compensation Required	Comments
2110	Sweet Cherry	*Prunus avium*	Non-Native	1	22.5	3.0	Improbable	Fair	East A	Retain			Minor dieback; thin crown; small dead branches.
2111	Hawthorn species	*Crataegus sp.*	Native	1	12.0	3.0	Improbable	Fair	East A	Retain			Light pruning; minor vine.
2112	Sweet Cherry	*Prunus avium*	Non-Native	1	10.8	2.5	Improbable	Good	East A	Retain			Minor lean east; healthy crown.
2113	Hawthorn species	*Crataegus sp.*	Native	4	76.0	6.0	Possible	Fair	East A	Retain			Codominant leaders; small cavities 1m high; dead branches.
2114	Hawthorn species	*Crataegus sp.*	Native	1	18.8	3.0	Improbable	Fair	East A	Retain			Codominant leaders; arching crown with vines; leaf spots.
2115	Hawthorn species	*Crataegus sp.*	Native	1	14.8	3.0	Possible	Poor	East A	Retain			Broken branches; minor rot.
2116	Hawthorn species	*Crataegus sp.*	Native	1	18.4	2.0	Possible	Poor	East A	Retain			Main leader broken; vine in crown.
2117	Hawthorn species	*Crataegus sp.*	Native	1	16.7	3.0	Possible	Fair	East A	Retain			Basal cavity; asymmetrical crown; slight lean; epicormic growth.
2118	Black Cherry	*Prunus serotina*	Native	1	14.8	2.0	Improbable	Fair	East A	Remove	Street C	Yes	Asymmetrical crown due west; vines; slightly suppressed; light pruning.
2119	Hawthorn species	*Crataegus sp.*	Native	1	19.9	4.0	Possible	Fair	East A	Retain			Centre rot and sapwood rot evident; misshapen root flare; tall tree with full crown, leaf spots.
2120	Hawthorn species	*Crataegus sp.*	Native	1	28.0	4.5	Possible	Poor	East A	Retain			Asymmetrical crown due west; codominant leaders; history of branch failure; secondary stem rotted away; vines.
2121	Hawthorn species	*Crataegus sp.*	Native	2	13.4	2.5	Possible	Poor	East A	Retain			Primary stem dead and broken; leaning; asymmetrical crown to east, with vines throughout.
2122	Hawthorn species	*Crataegus sp.*	Native	2	23.0	3.0	Possible	Poor	East A	Retain			Leaning heavily north; some decay present.
2123	Hawthorn species	*Crataegus sp.*	Native	1	24.0	5.0	Possible	Poor	East A	Retain			Asymmetrical crown due north; vines; slightly suppressed; codominant leaders; included bark; history of branch failure.
2124	Black Cherry	*Prunus serotina*	Native	1	40.4	7.0	Possible	Fair	East A	Retain			Past codominant leader failed; crown thinning; wire around trunk; compartmentalized stem wounds.
2125	Red Oak	*Quercus rubra*	Native	3	87.0	7.0	Improbable	Good	East A	Retain			Asymmetrical crown due north; smaller stems suckers; vines; frost cracks; woundwood; suckers pruned at base; small dead branches; slight lean north.
2126	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	12.4	2.5	Improbable	Fair	East A	Retain			Asymmetrical crown due to large neighboring oak; exposed root flare; vine in crown.
2127	Sweet Cherry	*Prunus avium*	Non-Native	1	17.0	3.0	Possible	Fair	East A	Retain			Curved stem; poor union at scaffold branch; bark rubbing wound.
2128	Crack Willow	*Salix fragilis*	Non-Native	5	426.0	12.0	Possible	Fair	East A	Remove	Street C	Yes	Massive codominant stems spread from near base; history of some branch failures; large branch partly decayed, layering in soil; water sprouts; large longitudinal crack in 1 stem; relatively full crown with minor foliar necrosis.
2129	Black Cherry	*Prunus serotina*	Native	1	11.9	1.0	Improbable	Good	East A	Retain			Phototrophic growth ; light pruning.
2130	Crack Willow	*Salix fragilis*	Non-Native	1	42.3	4.0	Probable	Poor	East A	Remove	Condition	Yes	Stem uprooted; many stems suckering from original tree; vines; compartmentalized wounds.
2131	Crack Willow	*Salix fragilis*	Non-Native	1	12.4	2.5	Improbable	Fair	East A	Retain			Discrete stem but close to neighboring willow; minor foliar necrosis.
2132	Crack Willow	*Salix fragilis*	Non-Native	6	95.0	4.0	Possible	Fair	East A	Remove	Street C	Yes	Stems arising as water sprouts from prostrate, broken original stem; vines throughout lower crown; mostly healthy crown has minor foliar necrosis.
2133	Hawthorn species	*Crataegus sp.*	Native	3	36.0	1.5	Possible	Poor	East A	Retain			Branch rub; suppressed; vines; rot; broken top.
2134	Hawthorn species	*Crataegus sp.*	Native	2	11.8	2.5	Improbable	Good	East A	Retain			Secondary stem less than 10cm and fused with primary; water sprouts; leaf spots.
2135	Hawthorn species	*Crataegus sp.*	Native	1	12.3	2.0	Improbable	Fair	East A	Retain			Basal shoot becoming secondary stem; phototrophic growth.
2136	Hawthorn species	*Crataegus sp.*	Native	1	21.3	1.0	Possible	Poor	East A	Retain			Branch rub; suppressed; vines; rot; broken top.
2137	Common Apple	*Malus domestica*	Non-Native	1	43.1	4.0	Probable	Dead	East A	Remove	Condition	No	Dead and small branches shed; former stem failed, basal rot; vines heavy through crown.
2138	Hawthorn species	*Crataegus sp.*	Native	3	47.0	4.0	Improbable	Fair	East A	Retain			Asymmetrical crown due east; slightly suppressed; vines; included bark.
2139	Hawthorn species	*Crataegus sp.*	Native	1	15.6	2.5	Improbable	Good	East A	Retain			Wide branch angle; twisting branches.
2140	Hawthorn species	*Crataegus sp.*	Native	1	19.9	2.0	Improbable	Good	East A	Retain			Asymmetrical crown due south; stem lean east; reaction wood; branch rub.
2141	Hawthorn species	*Crataegus sp.*	Native	5	79.0	4.5	Possible	Fair	East A	Retain			Tall, spreading crown; 1 stem dead; 1 tight branch angle.
2142	Bitternut Hickory	*Carya cordiformis*	Native	1	10.4	1.0	Improbable	Good	East A	Retain			Phototrophic growth; vines; woody debris surrounding base.
2143	Hawthorn species	*Crataegus sp.*	Native	1	13.9	2.5	Possible	Fair	East A	Retain			Centre rot; tight branch angle; vines in crown.
2144	Hawthorn species	*Crataegus sp.*	Native	2	49.0	4.5	Possible	Fair	East A	Retain			Centre rot, with good "ram's horn" reaction wood; history of branch failure; secondary stem shedding bark; vines in crown.
2145	Hawthorn species	*Crataegus sp.*	Native	2	22.0	2.5	Possible	Fair	East A	Retain			Asymmetrical crown due east; vines; slightly suppressed.
2146	Black Cherry	*Prunus serotina*	Native	1	13.4	3.0	Possible	Fair	East A	Remove	Street C	Yes	Asymmetrical crown due to neighboring trees; fruiting body at base of small dead branch--potential sapwood decay.
2147	Hawthorn species	*Crataegus sp.*	Native	1	39.1	4.0	Possible	Poor	East A	Remove	Condition	Yes	Significant centre rot; history of failures; crossing branches with rubbing wounds; potential root rot.
2148	White Ash	*Fraxinus americana*	Native	1	17.7	2.5	Improbable	Good	East A	Retain			Asymmetrical crown due north; phototrophic growth; branch rub; slightly suppressed.
2149	Hawthorn species	*Crataegus sp.*	Native	1	14.6	2.5	Improbable	Fair	East A	Retain			Wide branch angle; vigorous growth; vines in crown.
2150	Black Cherry	*Prunus serotina*	Native	1	21.3	2.0	Improbable	Fair	East A	Retain			Asymmetrical crown due west; fungus; sucker; vines; slightly suppressed.
2151	Hawthorn species	*Crataegus sp.*	Native	1	15.2	2.0	Improbable	Good	East A	Retain			Asymmetrical crown due east; vines; slightly suppressed; light pruning.
2152	Common Apple	*Malus domestica*	Non-Native	1	38.6	6.0	Improbable	Fair	East A	Retain			Asymmetrical crown due east; stem lean east; light pruning; vines; slightly suppressed; rot; codominant leaders; included bark.
2153	Hawthorn species	*Crataegus sp.*	Native	1	11.1	2.0	Improbable	Fair	East A	Retain			Epicormic growth.
2154	Black Cherry	*Prunus serotina*	Native	1	12.2	2.0	Improbable	Fair	East A	Retain			Vines heavily throughout crown.
2155	Hawthorn species	*Crataegus sp.*	Native	2	29.0	3.0	Improbable	Fair	East A	Remove	Street C	Yes	Asymmetrical crown due west; vines; improper prune cuts; bird nest.
2156	Hawthorn species	*Crataegus sp.*	Native	2	24.0	3.0	Possible	Poor	East A	Remove	Condition	Yes	1 former stem cut, 1 with broken top; vines in crown.
2157	Hawthorn species	*Crataegus sp.*	Native	1	16.0	3.0	Improbable	Fair	East A	Retain			Asymmetrical crown due west; vines; slightly suppressed; branch rub; history of branch failure.
2158	Slippery Elm	*Ulmus rubra*	Native	1	15.4	2.0	Improbable	Fair	East A	Retain			Asymmetrical crown due north; epicormic growth; branch rub from adjacent tree; suppressed; phototrophic growth; vines.

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2159	Common Apple	*Malus domestica*	Non-Native	1	25.5	4.0	Possible	Poor	East A	Remove	Condition	Yes	Leaning heavily north; potential root failure; supported by adjacent tree; vines in crown.
2160	Hawthorn species	*Crataegus sp.*	Native	1	22.1	3.5	Improbable	Fair	East A	Retain			Codominant leaders with tight branch angles; crown leaning southwest.
2161	Hawthorn species	*Crataegus sp.*	Native	2	35.0	3.0	Possible	Fair	East A	Retain			Codominant stems; 1 stem has signs of a canker, other has centre rot evident; vines in crown.
2162	Hawthorn species	*Crataegus sp.*	Native	1	14.4	1.0	Possible	Poor	East A	Remove	Condition	Yes	Asymmetrical crown due north; rot on upper stem; secondary stem rotted away; fresh improper prune cuts.
2163	Hawthorn species	*Crataegus sp.*	Native	1	11.8	2.0	Possible	Poor	East A	Remove	Condition	Yes	Main stem cut; replacement stem broken at 3.5m.
2164	Hawthorn species	*Crataegus sp.*	Native	3	62.0	4.0	Possible	Fair	East A	Retain			Codominant stems fused and leaning north; 1 stem with small cavity and centre rot; fence wire through 1 stem with dead leader.
2165	Hawthorn species	*Crataegus sp.*	Native	4	59.0	5.0	Improbable	Fair	East A	Retain			Vines; slightly suppressed; branch rub; light pruning.
2166	Hawthorn species	*Crataegus sp.*	Native	5	69.0	5.0	Possible	Fair	East A	Retain			Codominant stems; history of branch failure; fence wire through stem; dense branching.
2167	Sweet Cherry	*Prunus avium*	Non-Native	1	14.4	3.5	Improbable	Fair	East A	Retain			Asymmetrical crown due west; vines; slightly suppressed; canker; gummosis.
2168	Hawthorn species	*Crataegus sp.*	Native	3	39.0	3.0	Possible	Fair	East A	Retain			Codominant stems; crossing branches and bark rubbing wounds; centre rot; healthy crown.
2169	Sweet Cherry	*Prunus avium*	Non-Native	1	26.6	3.5	Improbable	Good	East A	Retain			Crooked stem, slight lean; full crown, vines in lower part; sunken tissue on south side of trunk.
2170	Sweet Cherry	*Prunus avium*	Non-Native	1	13.2	2.5	Possible	Fair	East A	Retain			Crooked stem with wound from the failure of an adjacent tree.
2171	Sweet Cherry	*Prunus avium*	Non-Native	1	25.1	5.0	Improbable	Good	East A	Retain			Spreading crown; vines heavily in healthy crown.
2172	Sweet Cherry	*Prunus avium*	Non-Native	2	54.0	4.5	Possible	Fair	East A	Retain			Asymmetrical crown due east; stem lean east; codominant leaders; included bark; branch rub; smaller stem parallel to ground; basal wound compartmentalized.
2173	Peachleaf Willow	*Salix amygdaloides*	Native	1	25.1	2.0	Improbable	Good	East A	Retain			Light pruning; branch rub.
2174	Black Walnut	*Juglans nigra*	Native	1	13.3	2.0	Improbable	Good	East A	Retain			Included bark; little canker present.
2175	Black Walnut	*Juglans nigra*	Native	1	49.5	6.5	Improbable	Fair	East A	Retain			Large basal wound with woundwood at edges; dead wood, possible decay; good structure; few small dead branches; minor chlorosis.
2176	Black Walnut	*Juglans nigra*	Native	1	34.9	5.0	Improbable	Good	Central	Retain			Canker wounds well-closed; codominant leaders; vines in lower crown.
2177	Black Walnut	*Juglans nigra*	Native	1	41.7	5.0	Improbable	Fair	Central	Retain			Asymmetrical crown due north; branch rub; branches compartmentalized on adjacent building; light pruning; vines.
2178	Black Willow	*Salix nigra*	Native	3	62.0	3.5	Improbable	Fair	Central	Retain			Compartmentalized wound; cavity; light pruning; small dead branches; vines.
2179	Black Walnut	*Juglans nigra*	Native	1	24.3	3.5	Possible	Poor	Central	Retain			Canker in lower stem, bull's eye; crown thinning.
2180	Black Walnut	*Juglans nigra*	Native	1	16.6	2.5	Improbable	Fair	Central	Retain			Moderate crown thinning; foliar chlorosis and spotting.
2181	Black Walnut	*Juglans nigra*	Native	1	22.6	3.0	Improbable	Good	Central	Retain			Asymmetrical crown due north; vines; light pruning.
2182	Manitoba Maple	*Acer negundo*	Native	1	15.1	3.0	Possible	Poor	Central	Retain			Open stem wound above sharp bend in stem; poor structure; vines in crown.
2183	Manitoba Maple	*Acer negundo*	Native	1	11.1	2.0	Possible	Poor	Central	Retain			Lifted root plate; corrected lean; basal shoot; codominant leaders.
2184	Manitoba Maple	*Acer negundo*	Native	2	45.0	2.0	Possible	Poor	Central	Retain			Major crown dieback; epicormic growth; vines; suppressed.
2185	Black Walnut	*Juglans nigra*	Native	1	29.3	3.5	Possible	Good	Central	Retain			Light pruning; vines; small hanger.
2186	Black Walnut	*Juglans nigra*	Native	1	22.4	4.5	Improbable	Good	Central	Retain			Closed branch stubs; slightly asymmetrical crown with vines in lower part.
2187	Black Walnut	*Juglans nigra*	Native	1	20.5	5.0	Improbable	Good	Central	Retain			Light pruning; tight union at codominant leaders; vines in lower crown.
2188	Silver Maple	*Acer saccharinum*	Native	4	82.0	5.5	Possible	Good	Central	Retain			Codominant stems from base; vines in lower crown; minor epicormic growth.
2189	Black Willow	*Salix nigra*	Native	1	29.9	5.0	Improbable	Fair	Central	Retain			Asymmetrical crown due south; stem lean south; light pruning ; epicormic growth.
2190	Crack Willow	*Salix fragilis*	Non-Native	2	35.0	3.0	Possible	Fair	Central	Retain			Codominant stems leaning east; slightly suppressed; vines in crown.
2191	Crack Willow	*Salix fragilis*	Non-Native	2	37.0	3.0	Possible	Fair	Central	Retain			Codominant stems leaning northeast; sharp bends in 1 stem with some centre rot; vines in crown.
2192	Black Walnut	*Juglans nigra*	Native	1	14.1	2.5	Improbable	Good	Central	Retain			Light pruning.
2193	Black Walnut	*Juglans nigra*	Native	1	13.3	2.0	Improbable	Fair	Central	Retain			Light pruning; canker; vines; slightly suppressed.
2194	Black Walnut	*Juglans nigra*	Native	1	18.9	2.0	Improbable	Fair	Central	Retain			Light pruning; canker; vines; slightly suppressed.
2195	Black Willow	*Salix nigra*	Native	1	14.0	2.0	Improbable	Fair	Central	Retain			Asymmetrical crown due east; phototrophic growth; vines; light pruning.
2196	Manitoba Maple	*Acer negundo*	Native	1	15.1	2.5	Possible	Good	Central	Retain			Leaning south; vines in crown.
2197	Black Walnut	*Juglans nigra*	Native	1	10.5	2.0	Possible	Fair	Central	Retain			Once lost leader; poor attachment angle at new leading branch.
2198	Black Willow	*Salix nigra*	Native	1	16.0	3.0	Improbable	Fair	Central	Retain			Asymmetrical crown due south; phototrophic growth; stem lean south; secondary stem rotted away; vines.
2199	Black Willow	*Salix nigra*	Native	1	10.0	1.5	Improbable	Fair	Central	Retain			Asymmetrical crown due north; phototrophic growth; codominant leaders.
2200	Crack Willow	*Salix fragilis*	Non-Native	2	67.0	4.0	Possible	Fair	Central	Retain			Codominant stems from base; 1 former stem dead and broken; leaf miner action; vines in crown.
2201	Black Willow	*Salix nigra*	Native	1	15.6	1.0	Improbable	Poor	Central	Retain			Stem parallel to ground; rot; suckers.
2202	Black Willow	*Salix nigra*	Native	1	18.4	3.0	Improbable	Poor	Central	Retain			Asymmetrical crown due south; suckers; broken top.
2203	Crack Willow	*Salix fragilis*	Non-Native	4	124.0	4.5	Possible	Fair	Central	Retain			Codominant stems from shared root system; 2 broken tops; leaf miner action; minor epicormic growth.
2204	Black Willow	*Salix nigra*	Native	2	58.0	2.0	Possible	Dead	Central	Retain			Vines; broken tops.
2205	Manitoba Maple	*Acer negundo*	Native	1	12.5	2.5	Improbable	Fair	Central	Retain			Once lost leader, lateral becomes leader with vigorous growth.
2206	Norway Maple	*Acer platanoides*	Non-Native	1	14.1	2.5	Improbable	Fair	Central	Retain			Exposed roots and pistol butt; vines in crown suppressing tree.
2207	Crack Willow	*Salix fragilis*	Non-Native	1	26.4	2.0	Improbable	Fair	Central	Retain			Stem lean north; asymmetrical crown; epicormic growth; light pruning; broken top.
2208	Black Walnut	*Juglans nigra*	Native	1	22.1	4.0	Improbable	Fair	Central	Retain			Signs of potential canker; crown thinning.
2209	Manitoba Maple	*Acer negundo*	Native	1	21.5	3.0	Possible	Fair	Central	Retain			Codominant leaders; crown thinning; heavy fruit set.

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2210	Black Walnut	*Juglans nigra*	Native	1	12.8	1.0	Improbable	Fair	Central	Retain			Canker; vines; suppressed.
2211	Black Walnut	*Juglans nigra*	Native	1	31.5	5.0	Improbable	Fair	Central	Retain			Light pruning; vines up stem and through lower crown; crown not quite full.
2212	Black Walnut	*Juglans nigra*	Native	1	16.7	2.0	Improbable	Fair	Central	Retain			Vines; codominant leaders; included bark.
2213	Golden Weeping Willow	*Salix alba var. vitellina*	Non-Native	3	290.0	10.0	Possible	Fair	Central	Retain			Burl; branch rub; vines; history of branch failure; sapwood rot on a failed leader; mid-sized stem twisted off; epicormic growth; asymmetrical crown due south.
2214	Black Walnut	*Juglans nigra*	Native	1	19.6	3.0	Improbable	Good	Central	Retain			1 tight branch angle; some leaf spots.
2215	Black Walnut	*Juglans nigra*	Native	1	12.5	3.0	Improbable	Fair	Central	Retain			Asymmetrical crown due east; vines; phototrophic growth; slightly suppressed.
2216	Black Walnut	*Juglans nigra*	Native	1	16.0	3.0	Improbable	Fair	Central	Retain			Asymmetrical crown due south; vines; phototrophic growth; slightly suppressed.
2217	Black Walnut	*Juglans nigra*	Native	1	23.5	4.0	Improbable	Good	Central	Retain			Codominant leaders; healthy canopy, vine in lower crown.
2218	Black Walnut	*Juglans nigra*	Native	1	15.8	3.5	Improbable	Good	Central	Retain			Good structure; minor foliar chlorosis and spotting.
2219	Black Walnut	*Juglans nigra*	Native	1	20.2	3.0	Improbable	Fair	Central	Retain			Light pruning; canker; vines.
2220	Black Walnut	*Juglans nigra*	Native	1	23.8	3.5	Improbable	Fair	Central	Retain			Good structure; small leaves give thinned appearance but no dieback; vines in lower crown.
2221	Black Walnut	*Juglans nigra*	Native	1	31.8	4.0	Improbable	Fair	Central	Retain			Asymmetrical crown due east; vines; slightly suppressed; canker.
2222	Black Walnut	*Juglans nigra*	Native	1	23.8	4.0	Improbable	Good	Central	Retain			Tight branch angles; vines heavy in lower crown; light pruning.
2223	Manitoba Maple	*Acer negundo*	Native	2	31.0	0.5	Probable	Dead	Central	Remove	Condition	No	Covered in vines.
2224	Manitoba Maple	*Acer negundo*	Native	1	42.5	5.0	Possible	Fair	Central	Retain			Codominant stems with included bark; minor corrected lean; open wound from past failure; full crown.
2225	Black Walnut	*Juglans nigra*	Native	1	13.8	2.5	Improbable	Fair	Central	Retain			Vines; slightly suppressed.
2226	Black Walnut	*Juglans nigra*	Native	1	17.6	2.5	Improbable	Good	Central	Retain			Light pruning; vines in lower crown.
2227	Black Walnut	*Juglans nigra*	Native	1	22.1	3.0	Improbable	Fair	Central	Retain			Vines; slightly suppressed; asymmetrical crown due west.
2228	Black Walnut	*Juglans nigra*	Native	2	23.0	3.0	Possible	Fair	Central	Retain			Codominant stems with large canker; light pruning; minor epicormic growth.
2229	Black Walnut	*Juglans nigra*	Native	1	16.4	3.5	Improbable	Good	Central	Retain			Couple tight branch angles.
2230	Black Walnut	*Juglans nigra*	Native	1	10.0	2.5	Improbable	Fair	Central	Retain			Once lost leader.
2231	Black Walnut	*Juglans nigra*	Native	3	43.0	4.0	Improbable	Fair	Central	Retain			Asymmetrical crown due north; included bark; branch rub; canker.
2232	Black Walnut	*Juglans nigra*	Native	1	15.6	3.0	Improbable	Fair	Central	Retain			Once lost leader.
2233	Black Walnut	*Juglans nigra*	Native	1	13.0	2.0	Improbable	Good	Central	Retain			Asymmetrical crown due north; light pruning.
2234	Black Walnut	*Juglans nigra*	Native	1	11.3	3.0	Improbable	Good	Central	Retain			Strong leader; minor foliar chlorosis and spotting.
2235	Black Walnut	*Juglans nigra*	Native	1	11.3	2.5	Improbable	Fair	Central	Retain			Weak leader; minor foliar chlorosis and spotting.
2236	Black Walnut	*Juglans nigra*	Native	1	10.3	1.5	Improbable	Good	Central	Retain			Asymmetrical crown due north; light pruning.
2237	Black Walnut	*Juglans nigra*	Native	1	21.8	5.0	Improbable	Fair	Central	Retain			Asymmetrical crown due north; included bark; canker; vines.
2238	Black Walnut	*Juglans nigra*	Native	1	13.4	3.0	Improbable	Fair	Central	Retain			Once lost leader; minor foliar chlorosis and spotting.
2239	Black Walnut	*Juglans nigra*	Native	1	16.6	3.0	Improbable	Fair	Central	Retain			Codominant leaders; included bark; vines.
2240	Black Walnut	*Juglans nigra*	Native	1	18.2	3.0	Improbable	Good	Central	Retain			Vigorous low scaffold branch.
2241	Black Walnut	*Juglans nigra*	Native	1	20.1	4.0	Improbable	Fair	Central	Retain			Asymmetrical crown due west; included bark; light pruning.
2242	Black Walnut	*Juglans nigra*	Native	1	16.2	3.5	Improbable	Fair	Central	Retain			Slightly crooked stem with vigorous laterals; foliar necrosis on 1 small branch.
2243	Black Walnut	*Juglans nigra*	Native	1	18.1	4.0	Possible	Fair	Central	Retain			Crooked stem; light pruning.
2244	Black Walnut	*Juglans nigra*	Native	1	17.1	3.5	Improbable	Fair	Central	Retain			Asymmetrical crown due west; included bark; light pruning.
2245	Black Walnut	*Juglans nigra*	Native	2	36.0	4.0	Improbable	Fair	Central	Retain			Codominant leaders; included bark; canker; light pruning.
2246	Black Walnut	*Juglans nigra*	Native	1	14.9	2.5	Improbable	Fair	Central	Retain			Codominant leaders; vine up stem.
2247	Black Walnut	*Juglans nigra*	Native	1	14.9	1.5	Improbable	Fair	Central	Retain			Phototrophic growth ; light pruning; vines; slightly suppressed.
2248	Manitoba Maple	*Acer negundo*	Native	1	12.3	2.0	Improbable	Fair	Central	Retain			Asymmetrical crown due east; stem lean east; codominant leaders; included bark; debris surrounding base.
2249	Manitoba Maple	*Acer negundo*	Native	3	28.0	3.0	Possible	Fair	Central	Retain			Codominant stems growing from crack in old concrete pad, future girdling potential; vines in lower crown.
2250	Black Walnut	*Juglans nigra*	Native	1	19.1	4.0	Improbable	Fair	Central	Retain			Codominant leaders; vines in lower crown.
2251	Black Walnut	*Juglans nigra*	Native	1	15.7	3.5	Improbable	Fair	Central	Retain			Vines; slightly suppressed; included bark.
2252	Black Walnut	*Juglans nigra*	Native	1	19.5	4.0	Improbable	Fair	Central	Retain			Vines; slightly suppressed; included bark.
2253	Black Walnut	*Juglans nigra*	Native	1	16.5	3.5	Improbable	Good	Central	Retain			Codominant leaders.
2254	Black Walnut	*Juglans nigra*	Native	1	10.3	2.0	Possible	Fair	Central	Retain			Codominant leaders; wound from growing into shed roof.
2255	Black Walnut	*Juglans nigra*	Native	1	11.8	2.5	Improbable	Good	Central	Retain			Good structure; minor foliar chlorosis and spotting.
2256	Black Walnut	*Juglans nigra*	Native	1	14.0	2.5	Improbable	Good	Central	Retain			No visible defects; light pruning.
2257	Black Walnut	*Juglans nigra*	Native	1	13.2	3.0	Improbable	Good	Central	Retain			Good structure; light pruning.
2258	Black Walnut	*Juglans nigra*	Native	1	11.8	2.0	Improbable	Good	Central	Retain			Vigorous lower lateral.
2259	Black Walnut	*Juglans nigra*	Native	1	29.5	5.5	Improbable	Good	Central	Retain			Asymmetrical crown due east; light pruning.
2260	Black Walnut	*Juglans nigra*	Native	1	20.1	4.5	Improbable	Fair	Central	Retain			Lateral with tight branch angle crosses main stem.
2261	Black Walnut	*Juglans nigra*	Native	1	15.0	3.0	Improbable	Fair	Central	Retain			Asymmetrical crown due to neighboring trees; epicormic growth.
2262	Black Walnut	*Juglans nigra*	Native	1	20.4	3.5	Improbable	Fair	Central	Retain			Asymmetrical crown due to neighboring trees; codominant leaders; epicormic growth.
2263	Black Walnut	*Juglans nigra*	Native	1	14.9	2.5	Possible	Fair	Central	Retain			Once lost leader; swollen tissues in stem; wound mostly closed, potential centre rot.
2264	Black Walnut	*Juglans nigra*	Native	1	32.6	5.0	Improbable	Fair	Central	Retain			Codominant leaders; crown thinning; minor epicormic growth.
2265	Black Walnut	*Juglans nigra*	Native	1	20.2	4.0	Possible	Fair	Central	Retain			Asymmetrical crown due to neighboring trees; poor attachments in upper crown.
2266	Black Walnut	*Juglans nigra*	Native	1	26.6	4.0	Improbable	Good	Central	Retain			Asymmetrical crown due south; branch rub; light pruning.
2267	Black Walnut	*Juglans nigra*	Native	1	15.7	3.0	Improbable	Fair	Central	Retain			Crooked stem and phototrophic growth; few small dead branches.

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Location	Proposed Action	Rationale for Removal	Compensation Required	Comments
2268	Black Walnut	*Juglans nigra*	Native	1	13.0	1.0	Improbable	Fair	Central	Retain			Suppressed; light pruning; canker.
2269	Black Walnut	*Juglans nigra*	Native	1	25.2	4.0	Improbable	Fair	Central	Retain			Asymmetrical crown due west; light pruning; slightly suppressed.
2270	Black Walnut	*Juglans nigra*	Native	1	23.4	5.0	Improbable	Fair	Central	Retain			Couple tight branch angles; branch stubs not fully closed.
2271	Black Walnut	*Juglans nigra*	Native	1	10.1	2.0	Improbable	Fair	Central	Retain			Asymmetrical crown due south; light pruning; slightly suppressed.
2272	Black Walnut	*Juglans nigra*	Native	1	21.7	4.5	Improbable	Fair	Central	Retain			Bark seam at base, basal shoots; healthy crown.
2273	Black Walnut	*Juglans nigra*	Native	1	10.1	1.0	Improbable	Poor	Central	Retain			Canker; included bark; suppressed.
2274	Black Walnut	*Juglans nigra*	Native	1	38.4	6.0	Improbable	Good	Central	Retain			Asymmetrical crown due to neighboring trees; few small dead branches.
2275	Black Walnut	*Juglans nigra*	Native	1	41.8	6.0	Improbable	Good	Central	Retain			Few dead lower branches; good branch stub closure.
2276	Black Walnut	*Juglans nigra*	Native	1	12.5	2.5	Possible	Fair	Central	Retain			Target canker in lower stem; epicormic growth; asymmetrical crown, phototrophic growth.
2277	Black Walnut	*Juglans nigra*	Native	1	10.8	2.5	Improbable	Fair	Central	Retain			Once lost leader; asymmetrical crown, phototrophic growth.
2278	Black Walnut	*Juglans nigra*	Native	1	14.5	4.0	Improbable	Good	Central	Retain			Asymmetrical crown due to neighboring trees; codominant leaders.
2279	Black Walnut	*Juglans nigra*	Native	1	22.0	4.0	Possible	Fair	Central	Retain			Crooked stem; phototrophic growth; few dead branches.
2280	Black Walnut	*Juglans nigra*	Native	1	48.3	5.0	Possible	Fair	Central	Retain			Canker along main stem; history of branch pruning; asymmetrical crown due south; light pruning.
2281	Black Walnut	*Juglans nigra*	Native	1	14.2	3.5	Possible	Fair	Central	Retain			Crooked stem; phototrophic growth.
2282	Black Walnut	*Juglans nigra*	Native	1	31.0	4.5	Possible	Fair	Central	Retain			Asymmetrical crown due south; light pruning; epicormic growth; small dead branches; foliar necrosis.
2283	Black Walnut	*Juglans nigra*	Native	1	21.3	3.5	Possible	Fair	Central	Retain			Basal swelling, likely canker; tight branch angle; asymmetrical crown due to neighboring trees.
2284	Black Walnut	*Juglans nigra*	Native	1	16.7	4.0	Improbable	Fair	Central	Retain			Small, closed canker wounds; minor thinning; asymmetrical crown.
2285	Black Walnut	*Juglans nigra*	Native	1	36.5	6.0	Possible	Fair	Central	Retain			Asymmetrical crown due south; light pruning; epicormic growth; small dead branches.
2286	Black Walnut	*Juglans nigra*	Native	1	17.3	3.5	Improbable	Fair	Central	Retain			Epicormic growth.
2287	Black Walnut	*Juglans nigra*	Native	2	34.0	4.0	Improbable	Good	Central	Retain			Codominant stems; asymmetrical crown due to neighboring trees; minor epicormic growth; good branch stub closure.
2288	Black Walnut	*Juglans nigra*	Native	1	18.3	3.0	Improbable	Fair	Central	Retain			Light pruning; slightly suppressed; asymmetrical crown due south.
2289	Black Walnut	*Juglans nigra*	Native	1	10.0	0.5	Improbable	Good	Central	Retain			Light pruning; slightly suppressed; insect defoliation.
2290	Black Walnut	*Juglans nigra*	Native	1	37.4	5.0	Possible	Poor	Central	Retain			Asymmetrical crown due south; canker; light pruning; large dead branches.
2291	Black Walnut	*Juglans nigra*	Native	1	21.3	3.5	Improbable	Fair	Central	Retain			Asymmetrical crown due south; included bark; light pruning.
2292	Black Walnut	*Juglans nigra*	Native	1	36.9	4.5	Improbable	Good	Central	Retain			Light pruning; healthy crown.
2293	Black Walnut	*Juglans nigra*	Native	1	11.8	3.0	Improbable	Fair	Central	Retain			Asymmetrical crown due south; suppressed.
2294	Black Walnut	*Juglans nigra*	Native	1	30.9	5.0	Possible	Fair	Central	Retain			Codominant leaders; lower crown thinning; cankers in lower stem; epicormic growth.
2295	Black Walnut	*Juglans nigra*	Native	1	37.3	4.5	Improbable	Good	Central	Retain			Codominant leaders, wide union; included bark; light pruning.
2296	Black Walnut	*Juglans nigra*	Native	1	23.9	4.0	Improbable	Good	Central	Retain			Poor branch attachments; minor thinning.
2297	Black Walnut	*Juglans nigra*	Native	1	24.5	4.0	Improbable	Good	Central	Retain			Light pruning; included bark; branch rub.
2298	Black Walnut	*Juglans nigra*	Native	1	31.8	5.0	Improbable	Fair	Central	Retain			Minor thinning; good fruit set.
2299	Black Walnut	*Juglans nigra*	Native	1	13.5	2.0	Improbable	Fair	Central	Retain			Vines heavily in crown; slightly suppressed.
2300	Horsechestnut	*Aesculus hippocastanum*	Non-Native	1	76.0	4.0	Probable	Poor	Central	Remove	Condition	Yes	Both leaders have failed, some live branches; significant centre rot; foliar necrosis.
2301	Manitoba Maple	*Acer negundo*	Native	1	22.7	3.0	Possible	Fair	Central	Retain			Codominant leaders; leaning west, phototrophic growth from under former Horse chestnut; heavy fruit set.
2302	Horsechestnut	*Aesculus hippocastanum*	Non-Native	1	67.3	4.0	Probable	Poor	Central	Remove	Condition	Yes	Significant centre rot; sapwood decay, fruiting bodies; shedding bark; poor structure, codominant leaders; heavily covered in vines.
2303	Black Walnut	*Juglans nigra*	Native	1	10.1	2.0	Improbable	Fair	Central	Retain			Unbalanced crown; vines in crown; slightly crooked stem.
2304	Manitoba Maple	*Acer negundo*	Native	2	53.0	4.0	Possible	Poor	Central	Retain			Main stem has failed and lies on ground; secondary stem is a lateral from main, with broken top; heavily covered in vines; root rot.
2305	Manitoba Maple	*Acer negundo*	Native	1	12.9	2.5	Improbable	Fair	Central	Retain			Minor lean; vines in crown.
2306	Black Walnut	*Juglans nigra*	Native	1	20.5	3.5	Improbable	Fair	Central	Retain			Weak leader, large scaffold branches; vines in crown.
2307	Black Walnut	*Juglans nigra*	Native	1	28.8	3.5	Improbable	Fair	Central	Retain			Crown thinning; codominant leaders.
2308	Black Walnut	*Juglans nigra*	Native	1	19.3	3.0	Improbable	Fair	Central	Retain			Tight branch angles; minor chlorosis; minor epicormic growth.
2309	Black Walnut	*Juglans nigra*	Native	1	32.3	4.0	Improbable	Fair	Central	Retain			Closed stem wound; tight branch angle; minor chlorosis.
2310	Black Walnut	*Juglans nigra*	Native	1	37.8	5.0	Improbable	Good	Central	Retain			Codominant leaders with tight branch angle.
2311	Black Walnut	*Juglans nigra*	Native	1	20.5	4.0	Improbable	Good	Central	Retain			Codominant leaders; very minor thinning.
2312	Black Walnut	*Juglans nigra*	Native	1	23.4	4.5	Improbable	Good	Central	Retain			3 scaffold branches arise at same point; vines in healthy crown.
2313	Black Walnut	*Juglans nigra*	Native	1	11.2	2.5	Improbable	Good	Central	Retain			Vines in crown.
2314	Black Walnut	*Juglans nigra*	Native	1	15.5	3.0	Improbable	Good	Central	Retain			Codominant leaders.
2315	Black Walnut	*Juglans nigra*	Native	1	12.0	2.0	Improbable	Fair	Central	Retain			Irregular crown with vines.
2316	Golden Weeping Willow	*Salix alba var. vitellina*	Non-Native	1	14.3	4.5	Improbable	Fair	Central	Retain			Asymmetrical crown due west; epicormic growth; burls; phototrophic growth.
2317	Golden Weeping Willow	*Salix alba var. vitellina*	Non-Native	1	23.4	4.0	Possible	Fair	Central	Retain			Asymmetrical crown due west; stem lean; phototrophic growth; burl; history of branch failure.
2318	Golden Weeping Willow	*Salix alba var. vitellina*	Non-Native	1	29.5	3.5	Improbable	Fair	Central	Retain			Asymmetrical crown due north; burls; individual is a broken off branch of nearby tree that has re-rooted; phototrophic growth; stem lean.
2319	Manitoba Maple	*Acer negundo*	Native	1	14.0	3.0	Improbable	Fair	Central	Retain			Suppressed; asymmetrical crown due north; phototrophic growth.
2320	Golden Weeping Willow	*Salix alba var. vitellina*	Non-Native	1	191.1	12.0	Probable	Fair	Central	Remove	Condition	Yes	Asymmetrical crown due west; epicormic growth; codominant leaders; leaders fusing together; compartmentalized wounds; history of branch failure; insect damage on one leader; large hanger; overall crown healthy.

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Location	Proposed Action	Rationale for Removal	Compensation Required	Comments
2321	Manitoba Maple	*Acer negundo*	Native	1	71.3	6.0	Possible	Fair	Central	Retain			Asymmetrical crown due south; history of branch failure; shelf fungus on dead branch; included bark; light pruning; knot cavity; phototrophic growth.
2322	Golden Weeping Willow	*Salix alba var. vitellina*	Non-Native	4	233.0	12.0	Probable	Fair	Central	Retain			History of branch failure; leaders fused; cavity; insect damage; rot on dead branches; epicormic growth; burls.
2323	Manitoba Maple	*Acer negundo*	Native	1	61.2	6.0	Possible	Fair	Central	Retain			5 large branches/stems arise from same point on short stem (2m); swollen root flare; dead branch with fruiting bodies; basal shoots.
2324	Manitoba Maple	*Acer negundo*	Native	1	29.2	4.5	Improbable	Fair	Central	Retain			Phototrophic growth toward sod farm; some crown dieback.
2325	Black Walnut	*Juglans nigra*	Native	1	14.1	2.5	Improbable	Fair	Central	Retain			Slightly suppressed; vines; codominant leaders; included bark.
2326	Silver Maple	*Acer saccharinum*	Native	3	64.2	6.0	Improbable	Good	Central	Retain			Included bark; very minor thinning.
2327	Manitoba Maple	*Acer negundo*	Native	1	12.7	4.0	Improbable	Fair	Central	Retain			Growing on 45 degree angle; one sided crown; crown vigorous.
2328	Black Walnut	*Juglans nigra*	Native	1	14.0	3.0	Improbable	Good	Central	Retain			Full, open growth canopy; solid main stem.
2329	Golden Weeping Willow	*Salix alba var. vitellina*	Non-Native	1	206.2	12.0	Possible	Fair	Central	Retain			History of significant failures; decay in at least 1 stem; large branches reaching ground and arching back up; epicormic growth; water sprouts.
2330	Manitoba Maple	*Acer negundo*	Native	1	24.8	3.0	Improbable	Fair	Central	Retain			Asymmetrical crown due east; stem lean; phototrophic growth; slightly suppressed.
2331	Manitoba Maple	*Acer negundo*	Native	1	18.7	3.0	Improbable	Fair	Central	Retain			Epicormic growth; some riverbank grape in lower scaffold branches; crown relatively healthy.
2332	Manitoba Maple	*Acer negundo*	Native	1	12.1	1.5	Improbable	Fair	Central	Retain			Asymmetrical crown due east; stem lean; epicormic growth; slightly suppressed.
2333	Manitoba Maple	*Acer negundo*	Native	1	23.0	4.0	Improbable	Good	Central	Retain			Slight phototrophic growth; full, vigorous crown.
2334	Manitoba Maple	*Acer negundo*	Native	1	12.8	1.5	Improbable	Fair	Central	Retain			Slightly suppressed; debris piled on stem; epicormic growth.
2335	Manitoba Maple	*Acer negundo*	Native	2	46.0	6.0	Possible	Fair	Central	Retain			Phototrophic growth; some crown dieback; 1 stem on 45 degree angle.
2336	Manitoba Maple	*Acer negundo*	Native	1	23.8	3.5	Possible	Fair	Central	Retain			Leaning south; phototrophic growth from under huge willow; epicormic growth.
2337	Manitoba Maple	*Acer negundo*	Native	1	16.3	5.0	Improbable	Fair	Central	Retain			Asymmetrical crown due south; phototrophic growth; slightly suppressed; epicormic growth.
2338	Manitoba Maple	*Acer negundo*	Native	1	19.0	5.0	Improbable	Fair	Central	Retain			Slight phototrophic growth; epicormic growth; some crown dieback.
2339	Manitoba Maple	*Acer negundo*	Native	1	18.3	4.0	Possible	Fair	Central	Retain			Leaning west; crooked stem from being bent by large willow branch; epicormic growth.
2340	Golden Weeping Willow	*Salix alba var. vitellina*	Non-Native	1	18.5	4.5	Improbable	Good	Central	Retain			Asymmetrical crown due north; vines; burl; phototrophic growth.
2341	Manitoba Maple	*Acer negundo*	Native	1	18.4	3.5	Possible	Fair	Central	Retain			Dead sapwood shows at open basal wound, with woundwood at edges; leaning west from under large willow; basal shoots; lateral become dominant.
2342	Manitoba Maple	*Acer negundo*	Native	1	23.8	5.0	Possible	Fair	Central	Retain			Epicormic growth; phototrophic growth; large willow limb leaning against main stem.
2343	Hawthorn species	*Crataegus sp.*	Native	2	28.0	3.0	Improbable	Good	Central	Retain			Relatively full, vigorous crown; minor dieback; minimal rust.
2344	White Ash	*Fraxinus americana*	Native	1	14.8	2.5	Possible	Fair	Central	Retain			Codominant leaders; 10% live crown lost; epicormic growth; bark cracks.
2345	Hawthorn species	*Crataegus sp.*	Native	1	43.0	3.5	Improbable	Fair	Central	Retain			Asymmetrical crown due north; fungus on dead branches; large cavity where branch broke off; page wire through stem.
2346	White Ash	*Fraxinus americana*	Native	1	13.3	4.0	Improbable	Fair	Central	Retain			Asymmetrical crown due west; canker; healthy crown.
2347	White Ash	*Fraxinus americana*	Native	1	18.7	3.5	Possible	Fair	Central	Retain			Epicormic growth; some crown dieback; riverbank grape in lower scaffold branches.
2348	Hawthorn species	*Crataegus sp.*	Native	2	34.0	4.0	Improbable	Good	Central	Retain			Codominant stems with included bark; vines in crown; water sprouts; leaf spots.
2349	Hawthorn species	*Crataegus sp.*	Native	1	16.5	3.0	Improbable	Fair	Central	Retain			Some crown dieback with riverbank grape in crown.
2350	White Ash	*Fraxinus americana*	Native	1	29.9	4.0	Possible	Fair	Central	Retain			Closed bark cracks; sunken tissue; poor structure; epicormic growth; full crown.
2351	White Ash	*Fraxinus americana*	Native	1	11.6	2.5	Possible	Fair	Central	Retain			Suppressed, one sided crown due to neighbouring tree; crown otherwise full; eab exit hole.
2352	Hawthorn species	*Crataegus sp.*	Native	1	12.4	2.5	Improbable	Fair	Central	Retain			Asymmetrical crown due west; codominant leaders; included bark; slightly suppressed.
2353	Hawthorn species	*Crataegus sp.*	Native	4	90.0	3.5	Possible	Fair	Central	Retain			Vertical cracks and centre rot in 2 stems; history of branch failure; twisting branches.
2354	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	23.9	3.0	Improbable	Good	Central	Retain			Codominant leaders; included bark; vines.
2355	Hawthorn species	*Crataegus sp.*	Native	1	13.1	2.0	Improbable	Fair	Central	Retain			Minor rust; one sided crown due to neighbouring tree; minor dieback.
2356	Manitoba Maple	*Acer negundo*	Native	1	16.0	2.5	Improbable	Fair	Central	Retain			One sided crown with slight phototrophic lean; epicormic growth; minor dieback.
2357	Hawthorn species	*Crataegus sp.*	Native	3	44.0	3.0	Possible	Fair	Central	Retain			1 stem dead and broken; unbalanced crown; vines in crown due.
2358	Black Walnut	*Juglans nigra*	Native	1	28.5	4.5	Improbable	Fair	Central	Retain			Riverbank grape in lower scaffold; some crown dieback; solid main stem.
2359	Hawthorn species	*Crataegus sp.*	Native	2	44.0	3.5	Possible	Fair	Central	Retain			Codominant stems leaning heavily west; unbalanced crown; with vines.
2361	Black Walnut	*Juglans nigra*	Native	1	16.8	3.5	Improbable	Good	Central	Retain			Asymmetrical crown due east; vines; stem lean; slightly suppressed.
2362	Hawthorn species	*Crataegus sp.*	Native	3	37.0	2.0	Possible	Poor	Central	Retain			Missing portion of crown; extensive crown dieback; insect feeding.
2363	Hawthorn species	*Crataegus sp.*	Native	2	33.0	2.5	Improbable	Good	Central	Retain			Relatively full, healthy crown; minor rust.
2364	Hawthorn species	*Crataegus sp.*	Native	1	14.3	2.5	Possible	Fair	Central	Retain			Split leader, still living; unbalanced crown.
2365	Hawthorn species	*Crataegus sp.*	Native	1	19.4	2.5	Possible	Fair	Central	Retain			Arching lean west; large overextended scaffold branch; vine in unbalanced crown; water sprouts.
2366	Hawthorn species	*Crataegus sp.*	Native	2	39.0	4.0	Improbable	Fair	Central	Retain			Asymmetrical crown due west; small stem major lean; branch rub; vines; dead branches, rot.

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2367	Hawthorn species	*Crataegus sp.*	Native	4	68.0	3.5	Probable	Fair	Central	Remove	Condition	Yes	1 dead stem, probable to fail; asymmetrical crown due to neighboring trees; potential basal rot.
2368	Manitoba Maple	*Acer negundo*	Native	1	30.4	5.5	Improbable	Fair	Central	Retain			Growing on 45 degree angle; epicormic growth; minor dieback.
2369	Manitoba Maple	*Acer negundo*	Native	5	34.0	2.5	Improbable	Fair	Central	Retain			Relatively full crown; small bark crack with bark lifting; epicormic growth.
2370	Manitoba Maple	*Acer negundo*	Native	6	119.0	6.0	Improbable	Fair	Central	Retain			Light pruning in lower scaffold branches; epicormic growth; some crown dieback.
2371	Manitoba Maple	*Acer negundo*	Native	3	62.0	5.0	Improbable	Fair	Central	Retain			Codominant stems with included bark at base; leaning east; girdling root.
2372	Black Cherry	*Prunus serotina*	Native	1	24.5	4.0	Improbable	Good	Central	Retain			1 former stem failed, leaving tear wound at base; healthy crown though asymmetrical due to neighboring trees; 2 crossing branches.
2373	Hawthorn species	*Crataegus sp.*	Native	3	52.0	4.5	Improbable	Fair	Central	Retain			Asymmetrical crown due west; compartmentalized wounds; insect exit holes.
2374	Hawthorn species	*Crataegus sp.*	Native	1	19.5	5.5	Improbable	Fair	Central	Retain			Asymmetrical crown due east; dead branch with rot; epicormic growth.
2375	Hawthorn species	*Crataegus sp.*	Native	2	36.0	4.0	Improbable	Fair	Central	Retain			Asymmetrical crown due west; dead branches; light pruning.
2376	Hawthorn species	*Crataegus sp.*	Native	4	66.0	3.0	Possible	Fair	Central	Retain			Codominant stems; 1 major branch dead with sapwood decay; fairly upright; water sprouts.
2377	White Mulberry	*Morus alba*	Non-Native	2	22.0	3.5	Improbable	Fair	Central	Retain			Some crown dieback; epicormic growth.
2378	White Ash	*Fraxinus americana*	Native	1	20.7	3.0	Improbable	Fair	Central	Retain			Narrow crown; minor dieback; gallery.
2379	Hawthorn species	*Crataegus sp.*	Native	2	64.0	7.0	Possible	Fair	Central	Retain			Asymmetrical crown due west; cavities; insect exit holes; cracked leader; large hanger.
2380	Hawthorn species	*Crataegus sp.*	Native	4	101.0	5.0	Possible	Poor	Central	Retain			Rot down main stem; epicormic growth; crown dieback.
2381	Hawthorn species	*Crataegus sp.*	Native	1	21.5	2.5	Possible	Poor	Central	Retain			Wound in lower stem shows centre rot, has woundwood; heavily leaning east; few dead branches.
2382	Manitoba Maple	*Acer negundo*	Native	4	70.0	5.5	Improbable	Fair	Central	Retain			Asymmetrical crown due east; stem lean; pistol butt; phototrophic growth; dead branches.
2383	Hawthorn species	*Crataegus sp.*	Native	5	97.0	4.5	Possible	Fair	Central	Retain			Minor rust; some crown dieback; epicormic growth; weak branch union.
2384	Hawthorn species	*Crataegus sp.*	Native	1	20.2	3.0	Possible	Fair	Central	Retain			Leaning west; tight branch angle; twisting branches.
2385	Hawthorn species	*Crataegus sp.*	Native	2	31.0	4.5	Improbable	Fair	Central	Retain			Suppressed, one sided crown due to neighbouring tree; minor dieback.
2386	Hawthorn species	*Crataegus sp.*	Native	2	61.0	4.0	Improbable	Fair	Central	Retain			Basal rot in 1 stem; fencewire through stems; crossing branches.
2387	Hawthorn species	*Crataegus sp.*	Native	1	10.9	2.0	Improbable	Good	Central	Retain			Vigorous; branch rubbing.
2388	Hawthorn species	*Crataegus sp.*	Native	1	16.8	2.0	Improbable	Fair	Central	Retain			Asymmetrical crown due north; branch rub; light pruning; leaf spotting.
2389	Hawthorn species	*Crataegus sp.*	Native	1	11.2	2.0	Improbable	Fair	Central	Retain			Asymmetrical crown due north; branch rub; light pruning; leaf spotting.
2390	Hawthorn species	*Crataegus sp.*	Native	1	11.8	2.0	Improbable	Fair	Central	Retain			Crossing branches; leaf spots (potential herbicide drift); asymmetrical crown.
2391	Hawthorn species	*Crataegus sp.*	Native	2	27.0	4.5	Improbable	Fair	Central	Retain			Dieback in large scaffold branch; minor evidence of rot.
2392	Hawthorn species	*Crataegus sp.*	Native	2	11.2	3.5	Possible	Fair	Central	Retain			1 stem mostly gone with extensive rot; small stem with reaction growth; minor dieback.
2393	Hawthorn species	*Crataegus sp.*	Native	3	42.0	4.0	Improbable	Fair	Central	Retain			Asymmetrical crown due west; branch rub; stem compartmentalized over page wire; light pruning.
2394	Hawthorn species	*Crataegus sp.*	Native	4	64.0	4.0	Improbable	Fair	Central	Retain			Basal rot 1 stem; centre rot 1 stem; fencewire through; twisting form, crossing branches; bark rubbing wounds.
2395	Hawthorn species	*Crataegus sp.*	Native	4	87.0	4.0	Improbable	Fair	Central	Retain			1 dead branch; twisting form.
2396	Hawthorn species	*Crataegus sp.*	Native	1	12.7	3.0	Improbable	Good	Central	Retain			Some epicormic growth; light pruning dieback in lower scaffold branches; crown otherwise healthy.
2397	Hawthorn species	*Crataegus sp.*	Native	2	36.0	5.0	Improbable	Fair	Central	Retain			Asymmetrical crown due west; codominant leaders; light pruning; branch rub.
2398	Black Walnut	*Juglans nigra*	Native	1	11.0	2.5	Improbable	Good	Central	Retain			Tight branch angles; healthy crown.
2399	Hawthorn species	*Crataegus sp.*	Native	2	61.0	4.0	Improbable	Good	Central	Retain			Minor rust; light pruning in lower scaffold branches; open growth crown.
2400	Hawthorn species	*Crataegus sp.*	Native	1	24.0	2.0	Possible	Poor	Central	Remove	Street B	Yes	Asymmetrical crown due north; leaf spotting; branch rub; epicormic growth; broken top; vines.
2401	Hawthorn species	*Crataegus sp.*	Native	4	104.0	4.0	Improbable	Fair	Central	Remove	Street B	Yes	Asymmetrical crown due west; leaf spotting; branch rub; epicormic growth.
2402	Hawthorn species	*Crataegus sp.*	Native	1	12.0	2.5	Improbable	Fair	Central	Remove	Street B	Yes	Asymmetrical crown due south; leaf spotting; branch rub.
2403	Manitoba Maple	*Acer negundo*	Native	2	117.0	6.5	Improbable	Good	Central	Retain			Epicormic growth; full, vigorous crown.
2404	Black Cherry	*Prunus serotina*	Native	2	111.0	6.5	Improbable	Fair	Central	Retain			Fencewire through stem; fungus on basal bark; history of branch failures; healthy foliage.
2405	Hawthorn species	*Crataegus sp.*	Native	3	28.0	3.0	Possible	Poor	Central	Retain			Some branches dead; completely enveloped in riverbank grape; crown dieback.
2406	Hawthorn species	*Crataegus sp.*	Native	3	32.0	3.0	Improbable	Good	Central	Retain			Many-stemmed, shrub form; densely branched; slightly suppressed by grapevine.
2407	Hawthorn species	*Crataegus sp.*	Native	8	155.0	6.5	Improbable	Fair	Central	Retain			Dead branches; epicormic growth; vines; branch rub; one stem broken top; included bark.
2408	Manitoba Maple	*Acer negundo*	Native	5	112.0	5.0	Improbable	Good	Central	Retain			Full, vigorous crown; light pruning in lower scaffold branches.
2409	Manitoba Maple	*Acer negundo*	Native	2	65.0	6.0	Possible	Fair	Central	Retain			Codominant stems with included bark; history of branch failure; crack at base of 1 scaffold branch; epicormic growth; water sprouts.
2410	Hawthorn species	*Crataegus sp.*	Native	3	25.0	3.0	Improbable	Fair	Central	Retain			Light pruning in lower scaffold branches; draped in riverbank grape.
2411	Hawthorn species	*Crataegus sp.*	Native	6	11.8	3.0	Possible	Fair	Central	Retain			Some rust; light pruning in lower scaffold branches; riverbank grape throughout.
2412	Hawthorn species	*Crataegus sp.*	Native	13	15.5	3.5	Possible	Fair	Central	Retain			Multi stemmed tree with most <10cm; minor rust; riverbank grape throughout; some crown dieback.
2413	Hawthorn species	*Crataegus sp.*	Native	3	12.2	3.0	Improbable	Fair	Central	Retain			Crossing branches; basal shoots; draped in grape; 1 dead stem.

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Location	Proposed Action	Rationale for Removal	Compensation Required	Comments
2415	Hawthorn species	*Crataegus sp.*	Native	1	10.3	3.0	Improbable	Fair	Central	Retain			Asymmetrical crown due west; vines; branch rub; slightly suppressed; epicormic growth.
2417	Hawthorn species	*Crataegus sp.*	Native	1	13.3	4.0	Improbable	Fair	Central	Retain			Asymmetrical crown due west; branch rub; vines.
2418	Hawthorn species	*Crataegus sp.*	Native	2	23.0	2.5	Possible	Poor	Central	Retain			Almost dead; extensive crown dieback.
2419	Hawthorn species	*Crataegus sp.*	Native	3	53.0	4.0	Possible	Fair	Central	Retain			Centre rot, 1 stem; branch rubbing wounds; 1 past failure; draped in grape.
2420	Hawthorn species	*Crataegus sp.*	Native	2	32.0	5.0	Improbable	Fair	Central	Retain			Asymmetrical crown due west; vines; broken branches; slightly suppressed.
2421	Hawthorn species	*Crataegus sp.*	Native	1	22.0	5.0	Improbable	Fair	Central	Retain			Slightly suppressed, one sided crown due to neighbouring tree; minor dieback; evidence of decay in old branch wound.
2422	Hawthorn species	*Crataegus sp.*	Native	3	52.0	4.0	Improbable	Good	Central	Retain			Relatively full, vigorous crown.
2423	Hawthorn species	*Crataegus sp.*	Native	1	15.2	1.5	Possible	Poor	Central	Retain			Narrow crown; draped in riverbank grape.
2424	Hawthorn species	*Crataegus sp.*	Native	1	16.7	2.5	Possible	Fair	Central	Retain			Lean northeast; basal and centre rot; draped in grape; water sprouts.
2425	Hawthorn species	*Crataegus sp.*	Native	1	15.7	2.0	Improbable	Fair	Central	Retain			Arching lean west; phototrophic growth; 1 dead branch; water sprouts.
2426	Hawthorn species	*Crataegus sp.*	Native	3	45.0	5.0	Possible	Poor	Central	Retain			Asymmetrical crown due north; large cavity on mid-stem; insect exit holes; vines; dead branches.
2427	Hawthorn species	*Crataegus sp.*	Native	3	72.0	5.5	Possible	Poor	Central	Retain			Growing on 45 degree angle; some crown dieback; insect feeding; evidence of decay.
2428	Hawthorn species	*Crataegus sp.*	Native	3	67.0	5.0	Possible	Fair	Central	Retain			Some crown dieback; insect feeding; evidence of decay.
2429	Hawthorn species	*Crataegus sp.*	Native	5	75.0	4.5	Improbable	Fair	Central	Retain			1 stem dead; vines in crown; twisting branches.
2430	Hawthorn species	*Crataegus sp.*	Native	1	16.3	4.0	Possible	Fair	Central	Retain			Leader snapped; response growth throughout remainder of tree; minor dieback.
2431	Hawthorn species	*Crataegus sp.*	Native	7	124.0	5.0	Possible	Fair	Central	Retain			Basal rot; natural graft; crooked branches in arching, dominant crown.
2432	Common Apple	*Malus domestica*	Non-Native	1	33.3	4.5	Improbable	Good	Central	Retain			Leaning east; codominant leaders; water sprouts; good fruit set.
2433	Hawthorn species	*Crataegus sp.*	Native	1	14.0	4.0	Improbable	Fair	Central	Retain			Slightly suppressed, one sided crown due to neighbouring tree; crown otherwise healthy.
2434	Sweet Cherry	*Prunus avium*	Non-Native	1	32.4	3.5	Improbable	Good	Central	Retain			Minor dieback; seam up main stem with compartmentalization; self correcting root flare.
2435	Hawthorn species	*Crataegus sp.*	Native	2	23.0	2.5	Possible	Fair	Central	Retain			Leaning west; 1 broken stem; draped in grape.
2436	Hawthorn species	*Crataegus sp.*	Native	1	15.5	2.0	Possible	Fair	Central	Retain			Leaning east; longitudinal wound; draped in grape.
2437	Hawthorn species	*Crataegus sp.*	Native	1	11.9	2.0	Possible	Poor	Central	Retain			Relatively extensive crown dieback; insect feeding; draped in riverbank grape.
2438	Sweet Cherry	*Prunus avium*	Non-Native	1	15.9	3.5	Improbable	Good	Central	Retain			Slightly suppressed, one sided crown due to neighbouring tree; crown otherwise healthy; solid main stem.
2439	Hawthorn species	*Crataegus sp.*	Native	1	14.2	3.0	Possible	Fair	Central	Retain			Poor structure; deadwood in stem; draped in grape.
2440	Hawthorn species	*Crataegus sp.*	Native	2	28.0	2.5	Improbable	Fair	Central	Retain			Crossing stems with bark rubbing wounds; basal shoots; vines in crown.
2441	Hawthorn species	*Crataegus sp.*	Native	2	27.0	3.0	Possible	Fair	Central	Retain			1 stem nearly horizontal; poor structure, crossing branches; vines in crown.
2442	Hawthorn species	*Crataegus sp.*	Native	3	27.0	2.5	Possible	Poor	Central	Retain			Crown dieback; draped in riverbank grape; evidence of decay.
2443	Hawthorn species	*Crataegus sp.*	Native	1	13.3	2.5	Possible	Fair	Central	Retain			Asymmetrical crown; vines heavily in crown; 1 former stem failed.
2444	Sweet Cherry	*Prunus avium*	Non-Native	1	35.0	3.0	Improbable	Good	Central	Retain			Relatively vigorous crown with minor dieback; slight phototrophic growth; wound wood on main stem.
2445	Sweet Cherry	*Prunus avium*	Non-Native	1	14.3	3.0	Improbable	Good	Central	Retain			Asymmetrical crown; codominant leaders.
2446	Common Apple	*Malus domestica*	Non-Native	1	57.6	5.5	Improbable	Good	Central	Retain			Bark seams; codominant leaders form arching crown; heavy fruit set; water sprouts.
2447	Hawthorn species	*Crataegus sp.*	Native	1	32.6	4.5	Improbable	Fair	Central	Retain			Slight phototrophic lean; light pruning in lower scaffold branches; some crown dieback.
2448	Hawthorn species	*Crataegus sp.*	Native	1	12.2	2.5	Improbable	Fair	Central	Retain			One sided crown due to neighbouring tree; epicormic growth.
2449	Unknown		Native	1	56.8	2.5	Probable	Dead	Central	Remove	Condition	No	No distinguishable features; fencewire through stem; fruiting bodies at base; draped in grape.
2450	Black Walnut	*Juglans nigra*	Native	1	23.3	3.0	Possible	Fair	Central	Retain			Butt rot; included bark; draped in riverbank grape.
2451	Hawthorn species	*Crataegus sp.*	Native	1	13.5	2.5	Possible	Fair	Central	Retain			Crossing branches; minor lean north; draped in grape.
2452	Hawthorn species	*Crataegus sp.*	Native	1	12.3	2.5	Possible	Poor	Central	Retain			Sharp lean west; epicormic growth; draped in grape.
2453	Hawthorn species	*Crataegus sp.*	Native	2	21.0	4.0	Possible	Poor	Central	Retain			Growing on 65 degree angle; insect feeding; crown dieback.
2454	Black Walnut	*Juglans nigra*	Native	1	18.2	4.0	Improbable	Good	Central	Retain			Good structure; good fruit set; vine in crown.
2455	Hawthorn species	*Crataegus sp.*	Native	3	30.0	3.0	Possible	Poor	Central	Retain			Epicormic growth; extensive crown dieback; draped in riverbank grape.
2456	Hawthorn species	*Crataegus sp.*	Native	1	30.2	4.0	Improbable	Good	Central	Retain			Twisting branches; bark seam; vines and raccoon in crown.
2457	Hawthorn species	*Crataegus sp.*	Native	2	30.0	3.5	Possible	Poor	Central	Retain			Decay in a few wounds up both stems; 1 stem growing parallel to ground; draped in riverbank grape.
2458	Manitoba Maple	*Acer negundo*	Native	2	107.0	8.0	Possible	Fair	Central	Retain			Main stem partially failed at included bark between stems; poor structure; epicormic growth.
2459	Hawthorn species	*Crataegus sp.*	Native	1	10.9	2.5	Possible	Poor	Central	Retain			Suppressed crown due to neighbouring tree; decay in main stem; draped in riverbank grape.
2460	Hawthorn species	*Crataegus sp.*	Native	2	22.0	3.0	Possible	Poor	Central	Retain			One sided root flare; response growth; suppressed crown due to neighbouring tree; some crown dieback.
2461	Hawthorn species	*Crataegus sp.*	Native	3	33.0	3.5	Possible	Poor	Central	Retain			Roots lifted and exposed; leaning north; centre rot; draped in grape.
2462	Hawthorn species	*Crataegus sp.*	Native	1	15.2	2.0	Improbable	Fair	Central	Retain			Suppressed crown; draped in riverbank grape; minor decay.
2463	Hawthorn species	*Crataegus sp.*	Native	1	10.3	4.5	Possible	Poor	Central	Retain			Growing om 45 degree angle; suppressed crown; draped in riverbank grape; some decay.
2464	Black Cherry	*Prunus serotina*	Native	1	30.0	5.0	Possible	Fair	Central	Retain			30% live crown lost; leaning east; 1 dead scaffold branch.
2465	Hawthorn species	*Crataegus sp.*	Native	1	11.1	2.5	Possible	Fair	Central	Retain			Sapwood decay, fruiting bodies; divergent leaders; draped in grape.
2466	Hawthorn species	*Crataegus sp.*	Native	1	11.0	3.0	Possible	Poor	Central	Retain			Exposed root flare; growing on 45 degree angle; water sprouts; crown dieback.

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2467	Hawthorn species	*Crataegus sp.*	Native	3	64.0	5.5	Possible	Poor	Central	Retain			Weak branch union; some decay; some crown dieback.
2468	Hawthorn species	*Crataegus sp.*	Native	4	65.0	5.0	Improbable	Fair	Central	Retain			Included bark; abuts page wire fence; vines; epicormic growth; branch rub.
2469	Black Walnut	*Juglans nigra*	Native	1	24.7	5.0	Improbable	Good	Central	Retain			Tight angle between 2 leaders; good fruit set.
2470	Hawthorn species	*Crataegus sp.*	Native	1	20.6	5.5	Improbable	Fair	Central	Retain			Phototrophic growth; response growth; minor dieback.
2471	Hawthorn species	*Crataegus sp.*	Native	1	21.2	4.5	Improbable	Fair	Central	Retain			Phototrophic growth; response growth; minor dieback.
2472	Black Walnut	*Juglans nigra*	Native	1	19.3	3.0	Improbable	Good	Central	Retain			Vines; codominant leaders; included bark; dead mass of gypsy moth caterpillars.
2473	Black Walnut	*Juglans nigra*	Native	1	10.9	4.0	Improbable	Good	Central	Retain			Crown relatively vigorous with exception of riverbank grape in lower scaffold branches.
2474	Black Walnut	*Juglans nigra*	Native	1	10.0	2.5	Improbable	Good	Central	Retain			Vines; leaf spotting.
2475	Black Walnut	*Juglans nigra*	Native	1	40.8	5.0	Improbable	Fair	Central	Retain			Full, vigorous crown; 1 snapped scaffold branch; old branch wound with minor staining but also compartmentalization.
2476	Black Walnut	*Juglans nigra*	Native	1	23.1	4.0	Improbable	Good	Central	Retain			Vines; leaf spotting; codominant leaders; included bark.
2477	Black Walnut	*Juglans nigra*	Native	1	15.1	2.5	Improbable	Good	Central	Retain			Vines; leaf spotting; included bark.
2478	Black Walnut	*Juglans nigra*	Native	1	22.0	4.5	Improbable	Good	Central	Retain			Relatively full, vigorous crown; solid main stem.
2479	Black Walnut	*Juglans nigra*	Native	1	15.3	2.5	Improbable	Good	Central	Retain			Vines; leaf spotting; included bark.
2480	Black Walnut	*Juglans nigra*	Native	2	44.0	4.5	Improbable	Good	Central	Retain			Relatively full crown with minor dieback; some included bark between stem union.
2481	Black Walnut	*Juglans nigra*	Native	1	17.7	4.5	Improbable	Good	Central	Retain			Vines; leaf spotting; included bark.
2482	Hawthorn species	*Crataegus sp.*	Native	5	70.0	4.0	Improbable	Fair	Central	Retain			Branch rub; light pruning; exposed root crown; epicormic growth; vines.
2483	Black Walnut	*Juglans nigra*	Native	1	26.0	4.0	Improbable	Good	Central	Retain			Minor evidence of canker; full, vigorous crown; dead gypsy moth caterpillars.
2484	Black Walnut	*Juglans nigra*	Native	1	21.1	4.0	Improbable	Good	Central	Retain			Full, vigorous crown; solid main stem.
2485	Black Walnut	*Juglans nigra*	Native	1	30.9	4.5	Improbable	Poor	Central	Retain			Canker; leaf spotting; large basal wound with rot; partial compartmentalization.
2486	Black Walnut	*Juglans nigra*	Native	2	76.0	6.5	Improbable	Good	Central	Retain			Light pruning in lower scaffold, crown otherwise vigorous; included bark between stem union.
2487	Black Walnut	*Juglans nigra*	Native	1	26.9	4.0	Improbable	Fair	Central	Retain			Leaf spotting; included bark; bark stain; canker.
2488	Black Walnut	*Juglans nigra*	Native	1	39.4	5.5	Improbable	Good	Central	Retain			Minor crown dieback; solid main stem.
2489	Black Walnut	*Juglans nigra*	Native	2	41.0	5.0	Improbable	Fair	Central	Retain			Asymmetrical crown due south; included bark; leaf spotting.
2490	Black Walnut	*Juglans nigra*	Native	1	42.0	6.5	Improbable	Good	Central	Retain			Full, vigorous crown; some included bark between stem unions.
2491	Black Walnut	*Juglans nigra*	Native	1	24.9	4.0	Improbable	Good	Central	Retain			Asymmetrical crown due south; light pruning.
2492	Black Walnut	*Juglans nigra*	Native	1	26.8	4.0	Improbable	Good	Central	Retain			Minor light pruning in lower scaffold branches; solid main stem.
2493	Black Walnut	*Juglans nigra*	Native	1	28.0	5.0	Improbable	Good	Central	Retain			Asymmetrical crown due north; light pruning; vines; leaf spotting.
2494	White Elm	*Ulmus americana*	Native	1	13.5	3.0	Improbable	Fair	Central	Retain			Slightly suppressed crown due to neighbouring tree; epicormic growth.
2495	Black Walnut	*Juglans nigra*	Native	1	30.4	5.0	Improbable	Good	Central	Retain			Asymmetrical crown due north; light pruning; vines; leaf spotting; codominant leaders; included bark.
2496	Black Walnut	*Juglans nigra*	Native	1	25.9	5.0	Improbable	Fair	Central	Retain			Slightly unbalanced crown due to neighbouring tree; wound with compartmentalization; some crown dieback.
2497	Black Walnut	*Juglans nigra*	Native	1	14.3	2.0	Improbable	Good	Central	Retain			Asymmetrical crown due south; light pruning; vines; leaf spotting.
2498	Black Walnut	*Juglans nigra*	Native	1	36.7	5.0	Improbable	Good	Central	Retain			Light pruning; vines; leaf spotting; codominant leaders; included bark; canker.
2499	Black Walnut	*Juglans nigra*	Native	1	17.9	3.5	Improbable	Good	Central	Retain			Full, vigorous crown; solid main stem.
2500	Black Walnut	*Juglans nigra*	Native	1	40.8	7.0	Improbable	Good	Central	Retain			Light pruning; leaf spotting; included bark; codominant leaders; vines; canker.
2501	Black Walnut	*Juglans nigra*	Native	1	46.8	6.5	Improbable	Fair	Central	Retain			Full, vigorous crown with minor dieback only; some canker at root flare; minor evidence of decay along main stem.
2502	Black Walnut	*Juglans nigra*	Native	1	13.0	2.0	Improbable	Fair	Central	Retain			Asymmetrical crown due north; phototrophic growth; vines.
2503	Black Walnut	*Juglans nigra*	Native	1	31.9	6.0	Improbable	Good	Central	Retain			Light pruning; vines; leaf spotting.
2504	Black Walnut	*Juglans nigra*	Native	1	11.9	1.0	Possible	Poor	Central	Retain			Crown dieback; draped in riverbank grape.
2505	Black Walnut	*Juglans nigra*	Native	1	10.6	1.5	Improbable	Fair	Central	Retain			Light pruning; vines; leaf spotting; asymmetrical crown due south; canker; slightly suppressed.
2506	Black Walnut	*Juglans nigra*	Native	1	13.7	3.5	Improbable	Fair	Central	Retain			Some crown dieback, with riverbank grape throughout; all stages of gypsy moth on main stem; wound with compartmentalization.
2507	Black Walnut	*Juglans nigra*	Native	1	11.8	2.5	Improbable	Fair	Central	Retain			Light pruning; vines; leaf spotting; asymmetrical crown due south; slightly suppressed.
2508	Black Walnut	*Juglans nigra*	Native	1	25.6	5.0	Improbable	Good	Central	Retain			Light pruning; vines; leaf spotting; asymmetrical crown due south; codominant leaders; included bark.
2509	Black Walnut	*Juglans nigra*	Native	1	24.6	5.0	Improbable	Good	Central	Retain			Slightly one sided crown due to neighbouring tree; crown otherwise healthy; solid main stem.
2510	Black Walnut	*Juglans nigra*	Native	1	25.1	5.0	Improbable	Good	Central	Retain			Light pruning; vines; leaf spotting; codominant leaders; included bark.
2511	Black Walnut	*Juglans nigra*	Native	1	11.5	2.0	Improbable	Fair	Central	Retain			One sided and slightly suppressed crown due to neighbouring tree; some crown dieback.
2512	Black Walnut	*Juglans nigra*	Native	1	30.1	6.0	Improbable	Good	Central	Retain			Light pruning; vines; leaf spotting; asymmetrical crown due south; codominant leaders; included bark.
2513	Black Walnut	*Juglans nigra*	Native	1	12.3	3.0	Improbable	Fair	Central	Retain			One sided crown due to neighbouring tree; riverbank grape throughout.
2514	Black Walnut	*Juglans nigra*	Native	1	17.4	4.5	Improbable	Good	Central	Retain			Vines; leaf spotting; asymmetrical crown due north; codominant leaders; included bark.
2515	Black Walnut	*Juglans nigra*	Native	1	37.8	6.5	Improbable	Good	Central	Retain			Full, vigorous crown with minor light pruning in lower scaffold branches; solid main stem.
2516	Black Walnut	*Juglans nigra*	Native	1	34.5	6.0	Improbable	Fair	Central	Retain			Vines; leaf spotting; asymmetrical crown due south; included bark; canker.

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Location	Proposed Action	Rationale for Removal	Compensation Required	Comments
2517	Black Walnut	*Juglans nigra*	Native	1	19.0	4.5	Improbable	Fair	Central	Retain			One sided crown due to neighbouring tree; light pruning in lower scaffold branches; solid main stem.
2518	Black Walnut	*Juglans nigra*	Native	1	26.5	5.5	Improbable	Fair	Central	Retain			Vines; leaf spotting; codominant leaders; included bark; asymmetrical crown due north; canker.
2519	Black Walnut	*Juglans nigra*	Native	1	14.9	5.0	Improbable	Fair	Central	Retain			One sided, slightly suppressed crown due to neighbouring tree; some compartmentalization around dead limb.
2520	Black Walnut	*Juglans nigra*	Native	1	15.9	4.0	Improbable	Fair	Central	Retain			Leaf spotting; asymmetrical crown due south; included bark; slightly suppressed.
2521	Black Walnut	*Juglans nigra*	Native	1	12.1	5.5	Improbable	Fair	Central	Retain			Phototrophic growth by main leader, at 45 degree angle; crown otherwise healthy.
2522	Black Walnut	*Juglans nigra*	Native	1	30.1	5.0	Improbable	Fair	Central	Retain			Leaf spotting; asymmetrical crown due north; included bark; canker; codominant leaders.
2523	Black Walnut	*Juglans nigra*	Native	1	10.7	3.5	Improbable	Fair	Central	Retain			One sided, suppressed crown due to neighbouring tree; minor dieback.
2524	Black Walnut	*Juglans nigra*	Native	2	55.0	6.0	Improbable	Fair	Central	Retain			Leaf spotting; branch rub; light pruning; canker.
2525	Black Walnut	*Juglans nigra*	Native	1	10.5	3.0	Improbable	Good	Central	Retain			Full, vigorous crown; solid main stem.
2526	Black Walnut	*Juglans nigra*	Native	1	46.4	7.0	Improbable	Good	Central	Retain			Leaf spotting; branch rub; light pruning; included bark.
2527	Black Walnut	*Juglans nigra*	Native	1	14.6	4.5	Improbable	Good	Central	Retain			Minor light pruning dieback; compartmentalization.
2528	Black Walnut	*Juglans nigra*	Native	1	25.0	4.5	Improbable	Fair	Central	Retain			Leaf spotting; branch rub; light pruning; canker.
2529	Black Walnut	*Juglans nigra*	Native	2	79.0	9.5	Improbable	Fair	Central	Retain			Included bark with staining; history of branch failure; some crown dieback.
2530	Black Walnut	*Juglans nigra*	Native	1	25.8	4.0	Improbable	Good	Central	Retain			Leaf spotting; light pruning.
2531	Black Walnut	*Juglans nigra*	Native	2	95.0	8.0	Improbable	Good	Central	Retain			Leaf spotting; light pruning; included bark.
2532	Black Walnut	*Juglans nigra*	Native	1	38.3	7.5	Improbable	Fair	Central	Retain			History of branch failure; some crown dieback; compartmentalization.
2533	Eastern White Pine	*Pinus strobus*	Native	1	13.5	2.0	Improbable	Good	Central	Retain			Slightly suppressed crown due to neighbouring tree; crown otherwise healthy; some riverbank grape in lower scaffold branches.
2534	Black Walnut	*Juglans nigra*	Native	1	33.0	5.0	Improbable	Good	Central	Retain			Some crown dieback; stream beneath tree leading to exposed roots; stem still solid.
2535	Black Walnut	*Juglans nigra*	Native	1	23.0	2.0	Improbable	Fair	Central	Retain			Leaf spotting; light pruning; improper prune cuts; epicormic growth; asymmetrical crown due west.
2536	Hawthorn species	*Crataegus sp.*	Native	1	16.4	0.5	Possible	Dead	Central	Retain			
2537	Black Walnut	*Juglans nigra*	Native	1	18.7	2.5	Improbable	Fair	Central	Retain			Leaf spotting; light pruning; asymmetrical crown due east.
2538	Black Walnut	*Juglans nigra*	Native	1	35.6	6.0	Improbable	Good	Central	Retain			Full, vigorous crown; compartmentalization.
2539	Black Walnut	*Juglans nigra*	Native	1	31.4	5.0	Improbable	Good	Central	Retain			Full, vigorous crown; self pruning with compartmentalization.
2540	Black Walnut	*Juglans nigra*	Native	4	98.0	7.0	Improbable	Fair	Central	Retain			Leaf spotting; light pruning; branch rub; compartmentalized wounds; included bark; asymmetrical crown due east.
2541	Black Walnut	*Juglans nigra*	Native	1	13.1	3.5	Improbable	Good	Central	Retain			Minor dieback; some riverbank grape in lower scaffold branches.
2542	Black Walnut	*Juglans nigra*	Native	1	14.9	3.0	Improbable	Fair	Central	Retain			Minor canker; riverbank grape in lower scaffold branches; included bark.
2543	Black Walnut	*Juglans nigra*	Native	1	12.3	3.0	Improbable	Fair	Central	Retain			Some crown dieback; riverbank grape throughout.
2544	Black Walnut	*Juglans nigra*	Native	1	23.7	3.0	Improbable	Good	Central	Retain			Leaf spotting; light pruning; vines; included bark.
2545	Black Walnut	*Juglans nigra*	Native	1	15.2	3.0	Improbable	Fair	Central	Retain			Some crown dieback; riverbank grape up main stem.
2546	Black Walnut	*Juglans nigra*	Native	1	15.4	3.0	Improbable	Fair	Central	Retain			Leaf spotting; light pruning; vines; included bark; asymmetrical crown due east.
2547	Black Walnut	*Juglans nigra*	Native	1	10.1	2.0	Improbable	Good	Central	Retain			Minor dieback; relatively full crown.
2548	Black Walnut	*Juglans nigra*	Native	1	10.5	4.0	Improbable	Fair	Central	Retain			One sided crown due to neighbouring tree; riverbank grape in lower scaffold branches.
2549	Black Walnut	*Juglans nigra*	Native	1	11.5	2.5	Improbable	Fair	Central	Retain			Leaf spotting; slightly suppressed; asymmetrical crown due east.
2550	Black Walnut	*Juglans nigra*	Native	2	62.0	4.0	Improbable	Good	Central	Retain			Leaf spotting; included bark; branch rub; light pruning.
2551	Black Walnut	*Juglans nigra*	Native	1	52.2	7.5	Improbable	Good	Central	Retain			Minor history of branch failure; full, vigorous crown; minor canker on main stem.
2552	Black Walnut	*Juglans nigra*	Native	1	71.6	5.5	Improbable	Good	Central	Retain			Included bark; codominant leaders; reaction wood at inclusion; history of branch pruning; compartmentalized wounds.
2553	Black Walnut	*Juglans nigra*	Native	1	47.1	6.0	Improbable	Fair	Central	Retain			History of branch failure; some crown dieback; gall on main stem.
2554	Black Walnut	*Juglans nigra*	Native	1	63.0	9.0	Improbable	Good	Central	Retain			Included bark; codominant leaders; history of branch pruning; compartmentalized wounds; light pruning.
2555	Hawthorn species	*Crataegus sp.*	Native	4	79.0	4.0	Improbable	Fair	Central	Retain			1 stem dead; some crown dieback; epicormic growth.
2556	Black Walnut	*Juglans nigra*	Native	1	23.7	2.5	Improbable	Fair	Central	Retain			Included bark; codominant leaders; light pruning; slightly suppressed.
2557	Black Walnut	*Juglans nigra*	Native	1	17.5	3.0	Improbable	Poor	Central	Retain			Suppressed crown due to neighbouring tree; rot in prune cut; response growth; some crown dieback.
2558	Black Walnut	*Juglans nigra*	Native	1	24.3	4.0	Improbable	Good	Central	Retain			Included bark; codominant leaders; light pruning; slightly suppressed; history of branch pruning; compartmentalized wounds; little canker with reaction wood.
2559	Black Walnut	*Juglans nigra*	Native	1	11.3	3.5	Improbable	Good	Central	Retain			Slightly one sided crown due to neighbouring tree; crow otherwise healthy; included bark between branch union.
2560	Black Walnut	*Juglans nigra*	Native	1	56.0	8.0	Improbable	Good	Central	Retain			Asymmetrical crown due south; light pruning; little crown dieback.
2561	Black Walnut	*Juglans nigra*	Native	1	21.4	4.0	Improbable	Good	Central	Retain			Minor dieback; slight phototrophic growth.
2562	Black Walnut	*Juglans nigra*	Native	1	37.8	7.0	Improbable	Good	Central	Retain			Asymmetrical crown due south; light pruning; little crown dieback; vines.
2563	Black Walnut	*Juglans nigra*	Native	1	70.4	9.0	Improbable	Good	Central	Retain			Large, well dispersed crown with minor dieback; seams up main stem with compartmentalization; great looking mature tree.
2564	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	96.5	10.0	Possible	Poor	Central	Retain			Asymmetrical crown due south; light pruning; crown dieback; large basal wound with rot; compartmentalized; codominant leaders; included bark; cavities; branch rub; history of branch failure.

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2565	Black Walnut	*Juglans nigra*	Native	1	40.4	6.0	Improbable	Good	Central	Retain			Slightly one sided crown due to neighbouring tree; minor dieback; solid main stem.
2566	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	47.4	6.0	Possible	Poor	Central	Retain			Unbalanced root flare; ground washed away from one side of root flare by wet area; one sided crown with some crown dieback; some rot in root flare.
2567	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	76.3	8.0	Possible	Fair	Central	Retain			Compartmentalized wounds; cavities; codominant leaders; included bark; hanger; branch rub.
2568	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	85.7	7.0	Possible	Poor	Central	Retain			Evidence of decay at root flare; asymmetrical crown; dieback in main leader; large cavity with staining on main stem.
2569	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	81.5	7.0	Improbable	Fair	Central	Retain			Minor dieback; relatively good condition for age; knot hole cavities (not suitable for bats) with staining and decay.
2570	Red Oak	*Quercus rubra*	Native	1	61.5	9.0	Possible	Good	Central	Retain			Asymmetrical crown due east; slight lean east; light pruning; branch rub; large dead branch; erosion downslope.
2571	Horsechestnut	*Aesculus hippocastanum*	Non-Native	1	91.3	9.5	Possible	Fair	Central	Retain			History of branch failure; compartmentalized wounds; basal rot; epicormic growth; cavity; light pruning.
2572	Horsechestnut	*Aesculus hippocastanum*	Non-Native	1	29.3	2.0	Possible	Poor	Central	Retain			Extensive crown dieback; gypsy moth eggs; decay on main stem.
2573	Unknown		Native	1	28.4	0.5	Possible	Dead	Central	Retain			Snag with no crown or bark.
2574	Balsam Poplar	*Populus balsamifera*	Native	2	55.0	3.0	Probable	Poor	Central	Remove	Condition	Yes	One sided crown with extensive dieback; weak branch union; history of branch failure; decay in small wound.
2575	Balsam Poplar	*Populus balsamifera*	Native	1	14.5	3.0	Improbable	Fair	Central	Retain			Slightly asymmetrical crown due to neighbouring tree; minor dieback; self pruning.
2576	Balsam Poplar	*Populus balsamifera*	Native	1	27.2	4.0	Improbable	Fair	Central	Retain			Asymmetrical crown due south; light pruning; phototrophic growth; reaction wood at base.
2577	Balsam Poplar	*Populus balsamifera*	Native	1	13.8	3.0	Improbable	Good	Central	Retain			Slightly asymmetrical crown due to neighbouring tree; minor light pruning in lower scaffold branches; compartmentalization on stem seam.
2578	Balsam Poplar	*Populus balsamifera*	Native	1	20.4	4.0	Improbable	Fair	Central	Retain			Asymmetrical crown due south; light pruning; epicormic growth; slightly suppressed.
2579	Balsam Poplar	*Populus balsamifera*	Native	1	22.6	2.0	Possible	Fair	Central	Retain			Stem lean south; asymmetrical crown due south; epicormic growth; branch rub from adjacent uprooted tree; compartmentalized wound.
2580	Black Cherry	*Prunus serotina*	Native	1	40.4	8.0	Probable	Poor	Central	Remove	Condition	Yes	Mostly uprooted with extensive decay in root flare; on 45 degree angle; water sprouts.
2581	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	112.0	6.0	Possible	Poor	Central	Retain			Girdling root; open cavity with extensive decay; crown still relatively healthy.
2582	Black Walnut	*Juglans nigra*	Native	1	29.2	5.5	Improbable	Fair	Central	Retain			Canker; asymmetrical crown due south; stem lean; light pruning.
2583	Black Walnut	*Juglans nigra*	Native	1	28.7	3.0	Improbable	Good	Central	Retain			Minor light pruning in lower scaffold branches; solid main stem.
2584	Black Walnut	*Juglans nigra*	Native	1	12.5	2.5	Improbable	Fair	Central	Retain			Suppressed; light pruning; erosion downslope.
2585	Shagbark Hickory	*Carya ovata var. ovata*	Native	1	39.8	4.0	Possible	Fair	Central	Retain			Asymmetrical crown due north; compartmentalized wound, large open, some rot; crown dieback.
2586	White Willow	*Salix alba*	Non-Native	4	116.0	13.0	Improbable	Fair	Central	Retain			Re rooting throughout entire wet area; vigorous crown; stems mostly parallel to ground.
2587	Black Walnut	*Juglans nigra*	Native	1	17.3	2.0	Improbable	Fair	Central	Retain			Light pruning; codominant leaders; included bark; slightly suppressed.
2588	Sweet Cherry	*Prunus avium*	Non-Native	2	75.0	4.5	Possible	Fair	Central	Retain			Included bark; light pruning; sapwood rot on dead branch; crown dieback.
2589	Sweet Cherry	*Prunus avium*	Non-Native	1	21.8	2.5	Improbable	Poor	Central	Retain			Epicormic growth; relatively extensive crown dieback.
2590	Sweet Cherry	*Prunus avium*	Non-Native	2	50.0	2.0	Probable	Dead	Central	Retain			Broken top; small stem crown intact; cavities; erosion downslope.
2591	Black Walnut	*Juglans nigra*	Native	1	10.0	2.0	Improbable	Good	Central	Retain			Slightly suppressed crown due to neighbouring tree; crown otherwise healthy; growing in wet drainage feature on slope.
2592	Sweet Cherry	*Prunus avium*	Non-Native	1	53.6	1.5	Possible	Poor	Central	Retain			Epicormic growth only; decay on root flare; growing on slope.
2601	Sweet Cherry	*Prunus avium*	Non-Native	1	16.2	2.5	Possible	Poor	Central	Retain			Epicormic growth; crown dieback; decay in root flare.
2602	Sweet Cherry	*Prunus avium*	Non-Native	1	15.3	2.0	Possible	Poor	Central	Retain			Stem lean north; asymmetrical crown due north; phototrophic growth; crown dieback.
2603	Sweet Cherry	*Prunus avium*	Non-Native	1	13.9	2.5	Possible	Fair	Central	Retain			Some insect defoliation; partially girdling root; light pruning in lower scaffold branches.
2604	Hawthorn species	*Crataegus sp.*	Native	1	42.0	4.0	Possible	Poor	Central	Retain			Weak branch union; decay between stems; some crown dieback.
2605	Black Cherry	*Prunus serotina*	Native	1	38.0	4.5	Possible	Fair	Central	Retain			Asymmetrical crown due east; web worm; crown dieback; light pruning; canker; gummosis.
2606	Black Cherry	*Prunus serotina*	Native	1	73.5	5.5	Possible	Fair	Central	Retain			Gypsy moth egg sac; root burl; minor basal rot; light pruning; crown dieback.
2607	Manitoba Maple	*Acer negundo*	Native	1	30.1	2.0	Possible	Poor	Central	Retain			Leader snapped off; epicormic growth only; woodpecker damage; starting to lose bark.
2608	Hawthorn species	*Crataegus sp.*	Native	3	71.0	3.0	Possible	Fair	Central	Retain			Cavities; rust spots; codominant leaders; included bark; history of branch failure.
2609	Black Walnut	*Juglans nigra*	Native	3	79.0	6.0	Possible	Fair	Central	Retain			Weak branch unions; some canker on root flare and main stem; minor dieback in crown.
2610	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	62.7	10.0	Improbable	Good	Central	Retain			Light pruning; phototrophic growth; branch rub; small hangers.
2611	Manitoba Maple	*Acer negundo*	Native	1	55.0	1.0	Probable	Poor	Central	Remove	Condition	Yes	Main leader snapped off and parallel to ground; epicormic growth only.
2612	Hawthorn species	*Crataegus sp.*	Native	2	58.0	7.0	Possible	Fair	Central	Retain			History of branch failure; branch rub; phototrophic growth; included bark; hangers.
2613	Manitoba Maple	*Acer negundo*	Native	1	27.3	4.5	Possible	Poor	Central	Retain			Extensive crown dieback; epicormic growth; decay in root flare.

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2614	Manitoba Maple	*Acer negundo*	Native	3	75.0	5.0	Possible	Poor	Central	Retain			Fruiting body and rot on main stem; epicormic growth; narrow crown with some dieback.
2615	Shagbark Hickory	*Carya ovata var. ovata*	Native	1	39.8	5.0	Improbable	Good	Central	Retain			Very minimal dieback; solid main stem.
2616	Hawthorn species	*Crataegus sp.*	Native	1	21.8	4.0	Improbable	Fair	Central	Retain			Asymmetrical crown due east; water sprouts; improper prune cuts; stem lean east; branch rub.
2617	Hawthorn species	*Crataegus sp.*	Native	1	25.1	4.0	Possible	Poor	Central	Retain			Butt rot; open cavity with extensive decay just above root flare; crown still relatively full.
2618	Shagbark Hickory	*Carya ovata var. ovata*	Native	1	37.1	4.5	Improbable	Good	Central	Retain			Asymmetrical crown due west; branch rub; light pruning.
2619	Black Cherry	*Prunus serotina*	Native	1	46.9	5.0	Possible	Fair	Central	Retain			Phototrophic growth; decay in old wound from lost limb; some crown dieback; tent caterpillars.
2620	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	43.6	4.0	Improbable	Good	Central	Retain			Light pruning; branch rub.
2621	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	81.0	10.0	Improbable	Fair	Central	Retain			Reaction growth and compartmentalization along seam up main stem; slightly asymmetrical crown due to neighbouring tree; crown otherwise healthy; good condition for age.
2622	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	50.6	8.0	Improbable	Good	Central	Retain			Asymmetrical crown due south; phototrophic growth; branch rub; light pruning; debris abuts stem.
2623	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	58.2	9.0	Improbable	Good	Central	Retain			Just slightly asymmetrical due to neighbouring tree; crown otherwise healthy; branch rub in scaffold branch; solid main stem.
2624	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	37.8	8.0	Improbable	Good	Central	Retain			Asymmetrical crown due east; light pruning; small dead branches.
2625	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	57.8	9.0	Improbable	Good	Central	Retain			Full, vigorous crown; solid main stem; compartmentalized prune cuts; could benefit from minor pruning.
2626	Silver Maple	*Acer saccharinum*	Native	1	44.5	6.0	Possible	Fair	Central	Retain			Phototrophic growth with lean over driveway; epicormic growth; 1 upper branch dead; cable around main stem and small stems.
2627	Black Walnut	*Juglans nigra*	Native	1	69.5	7.0	Possible	Good	Central	Retain			Codominant leaders; included bark; small hanger; history of branch pruning, compartmentalized wounds.
2628	Black Walnut	*Juglans nigra*	Native	1	54.1	9.0	Improbable	Good	Central	Retain			Crown overhanging house; minor light pruning only; improper prune cuts showing signs of compartmentalization; solid main stem.
2629	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	2	109.0	9.0	Possible	Fair	Central	Retain			Weak branch union; decay in portions of smaller stem; irregular side branch growth; some crown dieback.
2630	Black Walnut	*Juglans nigra*	Native	1	60.9	5.0	Improbable	Good	Central	Retain			Asymmetrical crown due north; codominant leaders, wide union; little canker.
2631	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	36.4	5.5	Improbable	Good	Central	Retain			Slightly asymmetrical crown due to neighbouring tree; crown otherwise healthy; 1 lower scaffold branch in poor condition; prune to reduce failure; gypsy moth eggs.
2632	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	28.0	4.0	Possible	Fair	Central	Retain			Bark staining; phototrophic growth; large leader parallel to ground before extending upward; smaller leader perpendicular; epicormic growth; asymmetrical crown due north.
2633	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	37.2	9.0	Possible	Fair	Central	Retain			Phototrophic lean; some branch tip dieback; split in 1 large scaffold branch; prune to reduce failure.
2634	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	38.2	7.0	Improbable	Good	Central	Retain			Slightly asymmetrical crown due to neighbouring tree; crown otherwise healthy; minor dieback.
2635	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	40.3	4.0	Improbable	Good	Central	Retain			Sapsucker holes; light pruning; codominant leaders; included bark.
2636	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	10.4	3.5	Improbable	Good	Central	Retain			Straight, solid main stem; relatively full, vigorous crown.
2637	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	16.7	3.0	Possible	Poor	Central	Retain			Wound up main stem with extensive decay; some crown dieback; improper prune cuts.
2638	Black Walnut	*Juglans nigra*	Native	1	40.8	7.0	Improbable	Good	Central	Retain			Asymmetrical crown due north; compartmentalized wound over old canker; root canker, few throughout stem; codominant leaders, wide union.
2639	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	2	44.0	4.5	Possible	Fair	Central	Retain			Small cavity at root flare with decay; weak branch union; improper prune cuts with some decay; minor dieback.
2640	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	38.6	6.0	Improbable	Good	Central	Retain			Asymmetrical crown due east; light pruning.
2641	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	36.9	5.0	Improbable	Fair	Central	Retain			Some evidence of decay in root flare; response growth on main stem; relatively healthy crown.
2642	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	17.8	2.5	Improbable	Good	Central	Retain			Slightly suppressed; root crown abuts adjacent tree.
2643	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	29.1	3.0	Improbable	Good	Central	Retain			Compartmentalized wound on lower stem; light pruning.
2644	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	53.8	10.0	Improbable	Fair	Central	Retain			Slight phototrophic lean with corrective response growth in root flare; minor branch tip dieback; linear cavity up main stem with decay as well as compartmentalization.
2645	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	23.9	2.5	Improbable	Good	Central	Retain			Asymmetrical crown due west; light pruning.
2646	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	24.9	3.0	Possible	Fair	Central	Retain			Crown relatively healthy; open cavity along main stem with extensive decay however also compartmentalization.
2647	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	14.9	5.0	Improbable	Poor	Central	Retain			Asymmetrical crown due east; suppressed; phototrophic growth; branch rub; compartmentalized wound.

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2648	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	2	34.6	6.5	Improbable	Fair	Central	Retain			1 stem dead; main stem healthy; asymmetrical crown due to neighbouring tree.
2649	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	17.5	4.5	Improbable	Poor	Central	Retain			Asymmetrical crown due south; suppressed; phototrophic growth.
2650	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	45.0	5.5	Improbable	Good	Central	Retain			Asymmetrical crown due south; included bark; branch rub; phototrophic growth; light pruning; compartmentalized wounds.
2651	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	35.8	6.0	Improbable	Good	Central	Retain			Response growth over old prune cut; broad, well dispersed crown.
2652	Black Walnut	*Juglans nigra*	Native	1	64.3	6.0	Improbable	Fair	Central	Retain			Minor decay in root flare with staining, also response growth and compartmentalization; history of branch failure; minor dieback.
2653	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	33.0	6.0	Improbable	Fair	Central	Retain			Asymmetrical crown due south; phototrophic growth; suppressed; branch rub.
2654	Black Cherry	*Prunus serotina*	Native	1	16.1	4.0	Improbable	Fair	Central	Retain			Asymmetrical and slightly suppressed crown due to neighbouring tree; light pruning dieback.
2655	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	48.7	4.5	Improbable	Good	Central	Retain			Asymmetrical crown due north; included bark; phototrophic growth; light pruning.
2656	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	35.1	6.0	Improbable	Good	Central	Retain			Minor light pruning in lower scaffold branches; balanced root flare; full crown.
2657	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	12.4	2.0	Improbable	Good	Central	Retain			Light pruning; slightly suppressed.
2658	Black Cherry	*Prunus serotina*	Native	1	60.2	6.0	Possible	Fair	Central	Retain			Epicormic growth; minor branch tip dieback; branch stubs with decay, prune to reduce failure.
2659	Horsechestnut	*Aesculus hippocastanum*	Non-Native	1	83.4	8.0	Possible	Fair	Central	Retain			On verge of poor; evidence of decay up main stem and in old wounds; leaf blight; large limb dieback and rot.
2660	Black Walnut	*Juglans nigra*	Native	1	16.3	3.0	Improbable	Fair	Central	Retain			Asymmetrical crown due south; light pruning; slightly suppressed.
2661	Staghorn Sumac	*Rhus typhina*	Native	1	10.2	3.0	Improbable	Good	Central	Retain			Asymmetrical crown due south; large stand of 10 stems adjacent to this individual.
2662	Common Pear	*Pyrus communis*	Non-Native	1	58.8	5.0	Possible	Poor	Central	Retain			Open cavity between upper branch union with decay; branch and crown dieback.
2663	Manitoba Maple	*Acer negundo*	Native	5	86.0	5.0	Possible	Fair	Central	Retain			Epicormic growth; water sprouts; basal rot; phototrophic growth; asymmetrical crown due north.
2664	Black Walnut	*Juglans nigra*	Native	1	14.7	3.5	Improbable	Fair	Central	Retain			Asymmetrical crown due south; light pruning; phototrophic growth; slightly suppressed; canker.
2665	Black Walnut	*Juglans nigra*	Native	1	15.0	3.0	Improbable	Fair	Central	Retain			Open canker wound on main stem with decay, also some compartmentalization; slightly suppressed crown due to neighbouring tree.
2666	Black Walnut	*Juglans nigra*	Native	1	25.2	3.0	Possible	Fair	Central	Retain			Asymmetrical crown due north; light pruning; web worm; canker; phototrophic growth.
2667	Black Walnut	*Juglans nigra*	Native	2	45.0	5.5	Improbable	Fair	Central	Retain			Some canker on main stems; branch dieback.
2668	Black Walnut	*Juglans nigra*	Native	2	50.0	4.0	Improbable	Poor	Central	Retain			Canker; branch rub, stem compartmentalized branch; light pruning; foliar necrosis.
2669	Manitoba Maple	*Acer negundo*	Native	3	75.0	5.0	Possible	Fair	Central	Retain			Asymmetrical crown due south; stems lean east and south; epicormic growth; light pruning.
2670	Black Walnut	*Juglans nigra*	Native	1	10.8	3.0	Improbable	Fair	Central	Retain			One sided, suppressed crown due to neighbouring tree; slight phototrophic lean.
2671	Black Walnut	*Juglans nigra*	Native	1	23.4	5.0	Improbable	Fair	Central	Retain			Canker on main stem; light pruning dieback.
2672	Black Walnut	*Juglans nigra*	Native	1	22.7	2.5	Improbable	Good	Central	Retain			Light pruning; codominant leaders; included bark.
2673	Black Walnut	*Juglans nigra*	Native	2	43.0	6.0	Improbable	Fair	Central	Retain			Some canker on main stem; included bark between stem union; asymmetrical crown with some dieback.
2674	Black Walnut	*Juglans nigra*	Native	1	22.2	4.5	Possible	Poor	Central	Retain			Asymmetrical crown due south; canker; light pruning; phototrophic growth.
2675	Black Walnut	*Juglans nigra*	Native	1	30.1	5.0	Improbable	Fair	Central	Retain			Minor canker on main stem; asymmetrical crown with branch dieback; balanced root flare.
2676	Black Walnut	*Juglans nigra*	Native	1	13.6	2.0	Possible	Poor	Central	Retain			Asymmetrical crown due south; canker; epicormic growth; suppressed.
2677	Black Walnut	*Juglans nigra*	Native	1	20.2	6.0	Possible	Poor	Central	Retain			Canker along root flare and lower main stem; one sided crown; wound on upper main stem with decay; crown dieback.
2678	Black Walnut	*Juglans nigra*	Native	1	12.7	3.0	Possible	Fair	Central	Retain			Phototrophic growth; light pruning; slightly suppressed.
2679	Black Walnut	*Juglans nigra*	Native	1	17.9	4.5	Improbable	Fair	Central	Retain			One sided crown due to neighbouring tree; minor canker up main stem; minimal dieback.
2680	Black Walnut	*Juglans nigra*	Native	1	20.4	2.5	Improbable	Fair	Central	Retain			Asymmetrical crown due south; light pruning; phototrophic growth.
2681	Black Walnut	*Juglans nigra*	Native	1	12.5	2.5	Possible	Fair	Central	Retain			Asymmetrical crown due south; phototrophic growth; light pruning; slightly suppressed.
2682	Black Walnut	*Juglans nigra*	Native	1	21.5	5.0	Possible	Poor	Central	Retain			Canker on lower half of main stem; suppressed crown with dieback.
2683	Black Walnut	*Juglans nigra*	Native	1	20.6	3.5	Possible	Fair	Central	Retain			Asymmetrical crown due south; light pruning; phototrophic growth; slightly suppressed.
2684	Black Walnut	*Juglans nigra*	Native	1	46.7	7.0	Improbable	Fair	Central	Retain			Response growth over old seam; compartmentalized prune cuts; light pruning dieback.
2685	Black Walnut	*Juglans nigra*	Native	1	33.9	7.0	Improbable	Fair	Central	Retain			Asymmetrical crown due south; vines; light pruning; canker.
2686	Manitoba Maple	*Acer negundo*	Native	2	86.0	9.0	Improbable	Fair	Central	Retain			Included bark between stem union; light pruning dieback; epicormic growth.
2687	Black Walnut	*Juglans nigra*	Native	1	49.6	8.0	Possible	Fair	Central	Retain			Asymmetrical crown due south; canker; light pruning; phototrophic growth; water sprouts.
2688	Black Walnut	*Juglans nigra*	Native	1	28.7	4.0	Improbable	Fair	Central	Retain			Asymmetrical crown due north; phototrophic growth; light pruning.

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2689	Black Walnut	*Juglans nigra*	Native	1	13.0	4.0	Improbable	Fair	Central	Retain			Phototrophic growth; light pruning in lower scaffold; small branch cavity with decay.
2690	Sweet Cherry	*Prunus avium*	Non-Native	1	15.8	4.0	Possible	Poor	Central	Retain			Asymmetrical crown due south; light pruning; suppressed.
2691	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	101.7	11.0	Possible	Poor	Central	Retain			2 large open cavities on main stem; decay; large limb dieback; existing crown relatively healthy.
2692	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	50.0	8.0	Possible	Fair	Central	Retain			Cavity at root flare with some decay; large seam up main stem and side branch that led to compartmentalizing cavities; crown dieback.
2693	Black Walnut	*Juglans nigra*	Native	1	12.9	1.5	Probable	Poor	Central	Remove	Condition	Yes	Stem parallel to ground; water sprouts; suppressed; large broken branch resting on stem.
2694	Manitoba Maple	*Acer negundo*	Native	1	20.5	3.0	Possible	Fair	Central	Retain			Asymmetrical crown due south; stem lean south; water sprouts; phototrophic growth.
2695	Manitoba Maple	*Acer negundo*	Native	1	11.6	4.5	Improbable	Fair	Central	Retain			Epicormic growth; slight phototrophic growth, draped in riverbank grape.
2696	Black Walnut	*Juglans nigra*	Native	2	65.0	9.0	Possible	Fair	Central	Retain			Light pruning dieback; canker up main stem with some response growth.
2697	Black Walnut	*Juglans nigra*	Native	1	46.1	9.0	Possible	Fair	Central	Retain			Asymmetrical crown due south; history of branch failure; low scaffold branches; vines; canker; healthy crown.
2698	Black Walnut	*Juglans nigra*	Native	1	29.0	8.0	Improbable	Good	Central	Retain			Tree lost 1 upper limb but new growth sprouting; slightly asymmetrical crown due to neighbouring tree; crown otherwise healthy; riverbank grape and woodbine around lower main stem.
2699	Black Walnut	*Juglans nigra*	Native	1	34.1	5.0	Improbable	Fair	Central	Retain			Asymmetrical crown due north; canker; light pruning; phototrophic growth.
2700	Black Walnut	*Juglans nigra*	Native	1	28.7	3.0	Improbable	Fair	Central	Retain			Narrow crown with some lower scaffold dieback; solid main stem.
2701	Black Walnut	*Juglans nigra*	Native	1	30.6	6.0	Improbable	Fair	Central	Retain			Branch rub; included bark; canker; phototrophic growth.
2702	Black Walnut	*Juglans nigra*	Native	1	13.0	4.0	Improbable	Fair	Central	Retain			Some canker on main stem with decay; slightly asymmetrical crown due to neighbouring tree; crown otherwise healthy.
2703	Black Walnut	*Juglans nigra*	Native	1	50.4	8.0	Probable	Fair	Central	Remove	Condition	Yes	Codominant leaders; included bark; history of branch failure; large hanger; light pruning.
2704	Black Walnut	*Juglans nigra*	Native	1	26.1	4.5	Improbable	Good	Central	Retain			Well dispersed crown with minimal dieback; some canker with response growth.
2705	Black Walnut	*Juglans nigra*	Native	1	17.3	4.0	Improbable	Good	Central	Retain			Well dispersed crown with minimal dieback; solid main stem.
2706	Black Walnut	*Juglans nigra*	Native	1	10.6	2.5	Improbable	Good	Central	Retain			One sided crown due to neighbouring tree; crown otherwise healthy.
2707	Black Walnut	*Juglans nigra*	Native	1	12.0	1.5	Improbable	Good	Central	Retain			Light pruning; slightly suppressed.
2708	Black Walnut	*Juglans nigra*	Native	1	12.2	3.0	Improbable	Fair	Central	Retain			Light pruning; vines; codominant leaders, wide union.
2709	Black Walnut	*Juglans nigra*	Native	2	34.0	4.0	Improbable	Fair	Central	Retain			Included bark between stem union; riverbank grape in lower scaffold branches; asymmetrical crown due to neighbouring tree.
2710	Black Walnut	*Juglans nigra*	Native	1	27.0	3.0	Improbable	Fair	Central	Retain			Asymmetrical crown due north; light pruning; vines; branch rub; slightly suppressed.
2711	Black Walnut	*Juglans nigra*	Native	2	70.0	8.0	Improbable	Good	Central	Retain			Well dispersed crown with minimal dieback; included bark between stem union.
2712	Black Walnut	*Juglans nigra*	Native	1	29.3	4.0	Improbable	Fair	Central	Retain			Asymmetrical crown due east; light pruning; canker.
2713	Black Walnut	*Juglans nigra*	Native	1	23.9	4.0	Improbable	Fair	Central	Retain			Well dispersed crown with minimal dieback; some canker on main stem.
2714	Black Walnut	*Juglans nigra*	Native	1	84.9	12.0	Possible	Good	Central	Retain			Light pruning; minor crown dieback; small dead branches.
2715	Hawthorn species	*Crataegus sp.*	Native	2	39.0	3.5	Probable	Poor	Central	Remove	Condition	Yes	Extensive decay up from root flare and into main stem.
2716	Black Walnut	*Juglans nigra*	Native	1	66.7	9.0	Improbable	Good	Central	Retain			Light pruning; small dead branches; compartmentalized wound.
2717	Black Walnut	*Juglans nigra*	Native	1	67.3	8.0	Improbable	Fair	Central	Retain			Cavity at root flare with decay starting to move into main stem; full, well dispersed crown with minimal dieback; outdoor light and cable attached.
2718	Horsechestnut	*Aesculus hippocastanum*	Non-Native	1	74.6	0.5	Possible	Dead	Central	Retain			Possible wildlife tree; missing crown; relatively sheltered cavity that could be used by small mammals; loose bark but likely too open for bats.
2719	Black Walnut	*Juglans nigra*	Native	1	78.3	10.0	Possible	Fair	Central	Retain			Compartmentalized wound on upper stem; light pruning; cable wrapped around branch; dead branches; large hanger.
2720	Black Walnut	*Juglans nigra*	Native	1	20.8	4.5	Possible	Fair	Central	Retain			Canker on lower main stem; draped in riverbank grape; some crown dieback.
2721	Black Walnut	*Juglans nigra*	Native	1	14.8	2.0	Improbable	Fair	Central	Retain			Vines; slightly suppressed; branch rub.
2722	Black Walnut	*Juglans nigra*	Native	1	15.9	3.5	Improbable	Fair	Central	Retain			Minimal canker with some response growth; riverbank grape in lower scaffold branches; minimal dieback.
2723	Black Locust	*Robinia pseudoacacia*	Non-Native	2	23.0	3.0	Improbable	Fair	Central	Retain			Branch rub; included bark; light pruning.
2724	Black Locust	*Robinia pseudoacacia*	Non-Native	2	10.9	4.5	Improbable	Good	Central	Retain			Light pruning dieback; included bark between stem union.
2725	Black Locust	*Robinia pseudoacacia*	Non-Native	2	22.0	3.0	Improbable	Fair	Central	Retain			Asymmetrical crown due south; light pruning; branch rub; canker; light pruning.
2726	Eastern Cottonwood	*Populus deltoides*	Native	1	13.5	1.5	Improbable	Good	Central	Retain			Full, vigorous crown; solid main stem.
2727	Black Locust	*Robinia pseudoacacia*	Non-Native	1	23.0	3.0	Improbable	Fair	Central	Retain			Light pruning; included bark; compartmentalized wound.
2728	Black Walnut	*Juglans nigra*	Native	1	11.4	4.0	Improbable	Good	Central	Retain			Slightly asymmetrical crown due to neighbouring tree; crown otherwise healthy; wound on upper limb compartmentalized.
2729	Manitoba Maple	*Acer negundo*	Native	5	53.0	4.0	Improbable	Fair	Central	Retain			Sharing root flare with adjacent tree; light pruning dieback; compartmentalization.
2730	Black Locust	*Robinia pseudoacacia*	Non-Native	1	77.2	7.0	Possible	Fair	Central	Retain			Vines; included bark; basal rot; light pruning; branch rub; phototrophic growth.
2731	Black Locust	*Robinia pseudoacacia*	Non-Native	1	38.0	10.0	Possible	Fair	Central	Retain			Draped in riverbank grape and cucumber; debris piled up against main stem; crown dieback.
2732	Black Locust	*Robinia pseudoacacia*	Non-Native	2	51.0	5.0	Improbable	Fair	Central	Retain			Asymmetrical crown due south; light pruning; branch rub.
2733	Black Locust	*Robinia pseudoacacia*	Non-Native	1	44.8	9.0	Improbable	Fair	Central	Retain			Asymmetrical crown due to neighbouring tree; light pruning dieback; solid main stem.

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2734	Black Walnut	*Juglans nigra*	Native	1	47.8	7.5	Improbable	Fair	Central	Retain			Asymmetrical crown due north; light pruning; vines; canker.
2735	Black Walnut	*Juglans nigra*	Native	1	49.1	9.0	Possible	Fair	Central	Retain			Extensive canker; included bark; light pruning; healthy crown.
2736	Black Walnut	*Juglans nigra*	Native	2	39.0	8.0	Improbable	Good	Central	Retain			Stems fusing together approx. 60cm up main stem; could benefit from pruning off second stem; crown relatively full and vigorous.
2737	Black Walnut	*Juglans nigra*	Native	1	53.3	8.5	Improbable	Fair	Central	Retain			Asymmetrical crown due south; light pruning; included bark; canker.
2738	Manitoba Maple	*Acer negundo*	Native	4	90.0	7.0	Probable	Poor	Central	Remove	Condition	Yes	Extensive decay at root flare; stems splitting apart; some bark loss; epicormic growth.
2739	Black Walnut	*Juglans nigra*	Native	1	17.8	5.0	Improbable	Good	Central	Remove	Street B	Yes	Slightly asymmetrical crown due to neighbouring tree; light pruning dieback.
2740	Black Walnut	*Juglans nigra*	Native	1	45.6	8.5	Improbable	Fair	Central	Remove	Street B	Yes	Asymmetrical crown due west; canker; compartmentalized wound; light pruning.
2741	Black Walnut	*Juglans nigra*	Native	1	46.7	8.0	Improbable	Fair	Central	Remove	Street B	Yes	2 wounds on main stem with compartmentalization; gypsy moth and caterpillars in crevice; minimal dieback.
2742	Black Cherry	*Prunus serotina*	Native	1	56.5	5.0	Possible	Poor	Central	Remove	Street B	No	Asymmetrical crown due north; large basal wound with rot; gummosis; major crown dieback; cavities.
2743	Black Walnut	*Juglans nigra*	Native	1	52.4	11.0	Possible	Poor	Central	Remove	Street B	Yes	Extensive canker; staining; included bark; crown dieback; codominant leaders.
2744	Black Walnut	*Juglans nigra*	Native	1	26.3	4.0	Improbable	Good	Central	Remove	Street B	Yes	Well dispersed crown with minimal dieback; asphalt shingles against root flare; 1 canker with response growth.
2745	Black Walnut	*Juglans nigra*	Native	1	25.4	5.0	Improbable	Good	Central	Remove	Street B	Yes	Asymmetrical crown due to neighbouring tree; crown otherwise healthy; minor canker at root flare.
2746	Black Walnut	*Juglans nigra*	Native	1	23.5	5.5	Possible	Fair	Central	Remove	Street B	Yes	Asymmetrical crown due east; canker; branch rub; light pruning; phototrophic growth.
2747	Black Walnut	*Juglans nigra*	Native	1	34.4	6.5	Improbable	Good	Central	Remove	Street B	Yes	Light pruning dieback; self pruning; well dispersed crown.
2748	Black Walnut	*Juglans nigra*	Native	1	28.4	6.0	Possible	Poor	Central	Remove	Street B	Yes	Extensive canker; slightly suppressed; phototrophic growth; light pruning.
2749	Black Walnut	*Juglans nigra*	Native	1	31.4	6.0	Improbable	Fair	Central	Remove	Street B	Yes	Canker around main stem with gull forming; minor canker up main stem; light pruning dieback.
2750	Black Walnut	*Juglans nigra*	Native	1	40.0	8.0	Possible	Poor	Central	Remove	Street B	Yes	Extensive canker; light pruning; asymmetrical crown due south.
2751	Black Walnut	*Juglans nigra*	Native	1	16.7	4.5	Improbable	Fair	Central	Remove	Street B	Yes	Some canker up main stem; minor dieback.
2752	Black Walnut	*Juglans nigra*	Native	1	18.4	4.0	Possible	Fair	Central	Remove	Street B	Yes	Asymmetrical crown due east; extensive canker; light pruning.
2753	Black Locust	*Robinia pseudoacacia*	Non-Native	1	11.3	3.5	Improbable	Fair	Central	Retain			One sided crown due to neighbouring tree; light pruning dieback.
2754	Black Locust	*Robinia pseudoacacia*	Non-Native	1	10.0	3.0	Improbable	Fair	Central	Retain			Narrow crown with light pruning in lower scaffold branches.
2755	Black Locust	*Robinia pseudoacacia*	Non-Native	1	10.0	2.5	Improbable	Fair	Central	Retain			Narrow crown with light pruning in lower scaffold ; branch wound with staining.
2756	Black Locust	*Robinia pseudoacacia*	Non-Native	2	10.3	2.5	Improbable	Fair	Central	Retain			Light pruning; slightly suppressed; bark staining.
2757	Black Locust	*Robinia pseudoacacia*	Non-Native	1	17.3	4.5	Improbable	Good	Central	Retain			Slightly asymmetrical crown due to neighbouring tree; crown otherwise healthy and relatively full.
2758	Black Locust	*Robinia pseudoacacia*	Non-Native	2	14.2	4.0	Improbable	Fair	Central	Retain			Included bark; light pruning; slightly suppressed; asymmetrical crown due east.
2759	Black Locust	*Robinia pseudoacacia*	Non-Native	1	11.1	5.0	Improbable	Good	Central	Retain			Compartmentalization around dead limb; relatively full crown.
2760	Black Locust	*Robinia pseudoacacia*	Non-Native	1	13.9	3.5	Improbable	Fair	Central	Retain			Light pruning; included bark; branch rub.
2761	Black Locust	*Robinia pseudoacacia*	Non-Native	1	10.1	3.0	Improbable	Fair	Central	Retain			Included bark with staining; some crown dieback.
2762	Silver Maple	*Acer saccharinum*	Native	3	158.0	8.0	Possible	Good	Central	Retain			Light pruning; branch rub; included bark; hanger.
2763	Shagbark Hickory	*Carya ovata var. ovata*	Native	1	33.9	4.0	Improbable	Good	Central	Retain			Compartmentalization around old limb; minor dieback; adjacent to driveway.
2764	Black Cherry	*Prunus serotina*	Native	1	54.0	6.0	Possible	Poor	Central	Retain			Sharing root flare with adjacent tree and competing crowns; crown dieback; some decay in upper large scaffold branches.
2765	Black Walnut	*Juglans nigra*	Native	1	33.4	6.0	Possible	Fair	Central	Retain			Asymmetrical crown due east/west; slightly suppressed; phototrophic growth; light pruning; branch rub.
2766	Black Walnut	*Juglans nigra*	Native	1	73.0	7.0	Improbable	Good	Central	Remove	Street B	Yes	Beautiful, mature tree; retain if possible; could benefit from minor pruning in lower scaffold branches.
2767	Shagbark Hickory	*Carya ovata var. ovata*	Native	1	61.1	5.0	Possible	Good	Central	Remove	Street B	Yes	Hanger; branch rub; drooping branches.
2768	Shagbark Hickory	*Carya ovata var. ovata*	Native	1	49.6	5.0	Improbable	Good	Central	Remove	Street B	Yes	Very minimal dieback; could benefit from minor pruning; retain if possible.
2769	Shagbark Hickory	*Carya ovata var. ovata*	Native	1	46.6	4.5	Improbable	Good	Central	Retain			Asymmetrical crown due south; epicormic growth; branch rub; light pruning.
2770	American Basswood	*Tilia americana*	Native	2	89.0	6.0	Improbable	Good	Central	Retain			Very full, vigorous crown; minor limb loss; could benefit from minor pruning.
2771	Red Oak	*Quercus rubra*	Native	2	45.0	6.0	Improbable	Good	Central	Retain			Asymmetrical crown due east; slightly suppressed; included bark; horseshoe in crook between stems; compartmentalized wound; light pruning.
2772	Shagbark Hickory	*Carya ovata var. ovata*	Native	1	41.4	6.0	Improbable	Good	Central	Retain			Full, vigorous crown with very minimal dieback; solid main stem; retain if possible.
2773	Black Cherry	*Prunus serotina*	Native	1	49.1	6.5	Possible	Fair	Central	Retain			Asymmetrical crown due east; light pruning; dead branches; phototrophic growth.
2774	Manitoba Maple	*Acer negundo*	Native	1	11.2	3.0	Improbable	Fair	Central	Retain			Phototrophic growth with lean toward sod farm; relatively full crown; epicormic growth.
2775	Black Walnut	*Juglans nigra*	Native	1	10.4	2.5	Improbable	Fair	Central	Retain			Asymmetrical crown due east; slightly suppressed; branch rub from adjacent spruce.
2776	Shagbark Hickory	*Carya ovata var. ovata*	Native	1	26.3	4.0	Improbable	Good	Central	Retain			Branch rub; compartmentalized wounds; drooping branches.
2777	Shagbark Hickory	*Carya ovata var. ovata*	Native	1	41.2	6.0	Improbable	Good	Central	Retain			Good structure; 1 dead, broken branch.
2778	Shagbark Hickory	*Carya ovata var. ovata*	Native	1	44.1	6.0	Improbable	Good	Central	Retain			Codominant leaders; included bark; drooping branches.
2779	Hawthorn species	*Crataegus sp.*	Native	1	35.0	2.5	Possible	Poor	Central	Retain			Significant centre rot; 60% live crown lost; epicormic growth.
2780	Black Walnut	*Juglans nigra*	Native	1	28.0	3.0	Improbable	Good	Central	Retain			Vines; phototrophic growth; included bark.
2781	Shagbark Hickory	*Carya ovata var. ovata*	Native	1	16.6	3.0	Improbable	Good	Central	Retain			Couple dead lower branches; good fruit set.

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Location	Proposed Action	Rationale for Removal	Compensation Required	Comments
2782	Manitoba Maple	*Acer negundo*	Native	3	10.4	2.0	Improbable	Fair	Central	Retain			Multiple stems under 10 DBH; included bark; vines; dieback.
2783	Manitoba Maple	*Acer negundo*	Native	2	11.0	3.0	Possible	Poor	Central	Retain			Secondary stem dead; leaning north; fruiting bodies; unbalanced crown.
2784	Manitoba Maple	*Acer negundo*	Native	1	11.0	1.5	Possible	Fair	Central	Retain			Secondary leader split to union, downed; suckering at union; dieback.
2785	Hawthorn species	*Crataegus sp.*	Native	2	49.0	4.0	Possible	Poor	Central	Retain			Basal rot; major scaffold limb failed; water sprouts; heavy fruit set.
2786	Hawthorn species	*Crataegus sp.*	Native	1	28.9	4.5	Possible	Fair	Central	Retain			Asymmetrical crown due west; codominant leaders; included bark; cavity; dieback; hangers.
2787	Black Cherry	*Prunus serotina*	Native	1	18.5	0.5	Possible	Dead	Central	Retain			Loose bark, potential for bats.
2788	Black Cherry	*Prunus serotina*	Native	1	41.5	4.5	Probable	Poor	Central	Remove	Condition	Yes	30% live crown lost; small fruiting bodies at crotch between trunk and scaffold branch; dieback.
2789	Black Walnut	*Juglans nigra*	Native	1	34.6	4.5	Possible	Good	Central	Retain			Light pruning; drooping branches; hanger.
2790	Red Oak	*Quercus rubra*	Native	1	31.1	6.5	Improbable	Good	Central	Retain			Asymmetrical crown due east; light pruning.
2791	Black Cherry	*Prunus serotina*	Native	1	67.9	6.0	Possible	Fair	Central	Retain			Pronounced root flare; codominant leaders; 20% dieback; epicormic growth; 4 dead branches.
2792	Black Walnut	*Juglans nigra*	Native	1	49.2	5.5	Improbable	Fair	Central	Retain			Canker; light pruning; compartmentalized wounds.
2793	Shagbark Hickory	*Carya ovata var. ovata*	Native	1	26.0	3.5	Improbable	Fair	Central	Retain			Basal cavity with woundwood; healthy crown; epicormic growth; strong leader.
2794	Shagbark Hickory	*Carya ovata var. ovata*	Native	1	57.5	6.0	Improbable	Good	Central	Retain			Asymmetrical crown due west; light pruning; minor dieback; web worm.
2795	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	89.8	8.0	Improbable	Good	Central	Retain			Massive scaffold branches; 5% dieback; interior thinning; decent branch stub closure.
2796	Hawthorn species	*Crataegus sp.*	Native	3	101.0	4.0	Possible	Fair	Central	Retain			Cavities; broken leader; branch rub; epicormic growth; dieback.
2797	Red Oak	*Quercus rubra*	Native	1	20.3	3.0	Improbable	Fair	Central	Retain			Asymmetrical crown due to neighbouring tree; 2 broken branches.
2798	Black Cherry	*Prunus serotina*	Native	1	31.5	4.0	Possible	Fair	Central	Retain			Possible lightning strike on former codominant stem, charred tissue; basal wound; dieback; asymmetrical crown; epicormic growth.
2799	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	15.0	3.0	Improbable	Fair	Central	Retain			Crown extends to near the ground; basal shoots; suppressed.
2800	Red Oak	*Quercus rubra*	Native	6	308.0	10.5	Improbable	Good	Central	Retain			Pallet boards affixed to stems, old tree house or stand; light pruning; large hangers; minor dieback; leaf clusters.
2801	Black Cherry	*Prunus serotina*	Native	1	66.5	6.5	Improbable	Fair	Central	Retain			Codominant leaders with included bark; 2 broken branches, 1 dead branch; tent caterpillar; light dieback.
2802	Red Oak	*Quercus rubra*	Native	1	96.0	8.0	Improbable	Good	Central	Retain			Open-grown with low branching; round crown with 5% dieback; overextended limb; epicormic growth.
2803	Red Oak	*Quercus rubra*	Native	1	100.7	11.5	Possible	Good	Central	Retain			Included bark; light pruning; branch rub; compartmentalized wounds; minor dieback; large dead branch.
2804	Red Oak	*Quercus rubra*	Native	1	34.7	5.0	Possible	Fair	Central	Retain			Swollen root flare around former stem stub; basal decay, small fruiting bodies; bark seam; asymmetrical crown due to neighbouring tree.
2805	Red Oak	*Quercus rubra*	Native	1	36.4	5.5	Improbable	Fair	Central	Retain			Asymmetrical crown due to neighboring tree; leaning slightly west.
2806	Red Oak	*Quercus rubra*	Native	1	73.4	9.5	Possible	Fair	Central	Retain			Light pruning; dead branches; drooping branches; dead leaf clusters.
2807	Red Oak	*Quercus rubra*	Native	1	94.5	11.5	Probable	Good	Central	Retain			Light pruning; compartmentalized wounds; drooping branches; large branches with rot; dead leaf clusters.
2808	Shagbark Hickory	*Carya ovata var. ovata*	Native	1	38.2	5.0	Improbable	Fair	Central	Retain			Basal rot, former stem dead and cut; pronounced root flare; codominant leaders; couple broken branches.
2809	Black Cherry	*Prunus serotina*	Native	1	52.7	6.0	Possible	Fair	Central	Retain			Light pruning; phototrophic growth; history of branch failure; basal cavity; compartmentalized wounds.
2810	Shagbark Hickory	*Carya ovata var. ovata*	Native	1	22.0	5.0	Improbable	Fair	Central	Retain			Basal rot, former stem dead and cut; pronounced root flare; codominant leaders; couple broken branches.
2811	Red Oak	*Quercus rubra*	Native	2	131.0	10.0	Possible	Fair	Central	Retain			Rot on lower stem of main trunk; compartmentalized wounds; light pruning; improper prune cuts; minor dieback; dead leaf clusters.
2812	Shagbark Hickory	*Carya ovata var. ovata*	Native	1	26.8	2.0	Improbable	Good	Central	Retain			Epicormic growth; slightly suppressed; asymmetrical crown due south.
2813	Horsechestnut	*Aesculus hippocastanum*	Non-Native	2	86.0	5.0	Improbable	Fair	Central	Retain			Early leaf browning; codominant stems; branch stubs not fully closed.
2814	Shagbark Hickory	*Carya ovata var. ovata*	Native	1	51.6	4.0	Improbable	Good	Central	Retain			DBH comprised of two fused stems; epicormic growth; included bark; branch rub.
2815	Hawthorn species	*Crataegus sp.*	Native	1	36.0	3.5	Possible	Fair	Central	Retain			History of branch failure; centre rot; epicormic growth; heavy fruit set.
2816	Black Cherry	*Prunus serotina*	Native	1	47.2	3.5	Improbable	Fair	Central	Retain			Stem lean east; basal cavity, rot; vines; light pruning.
2817	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	68.5	5.0	Improbable	Good	Central	Retain			Compact, round crown; decent branch stub closure.
2818	Bebb Willow	*Salix bebbiana*	Native	2	46.0	3.0	Possible	Poor	Central	Retain			Downed stem splayed south of point; water sprouts; cavities; rot; shelf mushrooms epicormic growth.
2819	Manitoba Maple	*Acer negundo*	Native	1	40.4	4.5	Improbable	Fair	Central	Retain			Poor structure; 10% dieback.
2820	Horsechestnut	*Aesculus hippocastanum*	Non-Native	1	60.9	4.5	Improbable	Fair	Central	Retain			Asymmetrical crown due south; included bark; light pruning; epicormic growth; leaf discolouration.
2821	Shagbark Hickory	*Carya ovata var. ovata*	Native	1	59.2	5.5	Improbable	Good	Central	Retain			Large basal cavity, good denning habitat; reaction wood in root flare; good branch stub closure; minor dieback.
2822	Shagbark Hickory	*Carya ovata var. ovata*	Native	1	39.5	3.5	Improbable	Good	Central	Retain			Slightly suppressed; drooping branches; light pruning; metal racks propped against stem; branch rub.
2823	Shagbark Hickory	*Carya ovata var. ovata*	Native	1	45.5	5.0	Improbable	Good	Central	Retain			Vines; leaf galls; branch rub; light pruning.
2824	Shagbark Hickory	*Carya ovata var. ovata*	Native	1	24.0	4.5	Improbable	Good	Central	Retain			Vine in lower crown.
2825	Shagbark Hickory	*Carya ovata var. ovata*	Native	1	34.3	4.0	Improbable	Good	Central	Retain			Vigorous lateral branch; asymmetrical crown due to neighboring tree; minor epicormic growth.

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2826	Black Cherry	*Prunus serotina*	Native	2	108.0	7.0	Possible	Fair	Central	Retain			Included bark; compartmentalized wounds; light pruning; gummosis; dieback on smaller stem.
2827	Manitoba Maple	*Acer negundo*	Native	3	123.0	6.5	Possible	Fair	Central	Retain			Major butt rot; centre rot evident; partial failure of 1 stem, leaning north; healthy crown with few dead branches.
2828	Silver Maple	*Acer saccharinum*	Native	3	177.0	13.0	Improbable	Good	Central	Retain			Asymmetrical crown due west; mower damage; included bark; compartmentalized wounds; light pruning; branch rub.
2829	Shagbark Hickory	*Carya ovata var. ovata*	Native	1	39.6	4.5	Improbable	Fair	Central	Retain			Healthy crown, asymmetrical crown due to neighboring tree; epicormic growth; branch stubs not closed.
2830	Shagbark Hickory	*Carya ovata var. ovata*	Native	1	39.9	5.0	Improbable	Good	Central	Retain			Healthy crown, asymmetrical crown due to neighboring tree; codominant leaders; good branch stub closure; chain supporting hammock around stem.
2831	Shagbark Hickory	*Carya ovata var. ovata*	Native	1	50.7	7.0	Improbable	Good	Central	Retain			Light pruning; drooping branches; compartmentalized wounds; hammock chain wrapped around stem.
2832	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	77.4	6.0	Possible	Fair	Central	Retain			Large stem wound from past limb failure, decay; branch stub holes; oversized scaffold branches; minor dieback.
2833	Freeman's Maple	*Acer X freemanii*	Native	2	29.0	4.0	Improbable	Fair	Central	Retain			Stem lean north; included bark; suppressed.
2834	Common Plum	*Prunus domestica*	Non-Native	2	55.0	5.0	Possible	Fair	Central	Retain			Branch rub; dieback; included bark; bark cracks; ladder resting on stem; vines.
2835	Red Oak	*Quercus rubra*	Native	1	40.2	5.5	Improbable	Good	Central	Retain			Asymmetrical crown due east; slightly suppressed; light pruning; wooden structure against stem.
2836	Black Walnut	*Juglans nigra*	Native	1	28.0	4.5	Improbable	Good	Central	Retain			Bark seam; included bark; crooked stem, crossing branches; good fruit set.
2837	Black Walnut	*Juglans nigra*	Native	1	33.5	5.0	Improbable	Fair	Central	Retain			Asymmetrical crown due east; slightly suppressed; branch rub.
2838	Manitoba Maple	*Acer negundo*	Native	1	20.6	3.5	Improbable	Fair	Central	Retain			Stem lean north; included bark; branch rub.
2839	Manitoba Maple	*Acer negundo*	Native	1	13.7	2.0	Improbable	Fair	Central	Retain			Stem lean; asymmetrical crown due east; slightly suppressed.
2840	White Spruce	*Picea glauca*	Native	1	30.5	3.0	Improbable	Good	Central	Retain			Light pruning.
2841	White Spruce	*Picea glauca*	Native	1	27.2	4.0	Improbable	Fair	Central	Retain			Light pruning.
2842	White Spruce	*Picea glauca*	Native	1	20.3	3.0	Improbable	Fair	Central	Retain			Light pruning.
2843	Shagbark Hickory	*Carya ovata var. ovata*	Native	2	56.0	6.0	Improbable	Good	Central	Retain			Included bark; branch rub.
2844	Shagbark Hickory	*Carya ovata var. ovata*	Native	1	34.0	6.0	Improbable	Good	Central	Retain			Asymmetrical crown due south; leaf spots; drooping branches.
2845	White Oak	*Quercus alba*	Native	1	52.5	8.0	Improbable	Good	Central	Retain			Asymmetrical crown due east; branch rub; included bark; light pruning; compartmentalized wounds.
2846	Black Cherry	*Prunus serotina*	Native	1	56.0	4.0	Probable	Poor	Central	Remove	Condition	Yes	70% live crown lost; shedding bark; water sprouts.
2847	Silver Maple	*Acer saccharinum*	Native	1	77.9	11.0	Improbable	Good	Central	Retain			Slight lean east; asymmetrical crown due east; codominant leaders; included bark; improper prune cut.
2848	Silver Maple	*Acer saccharinum*	Native	1	36.9	4.5	Possible	Fair	Central	Retain			Codominant leaders, 1 broken; epicormic growth; phototrophic growth.
2849	Silver Maple	*Acer saccharinum*	Native	1	74.7	9.0	Possible	Good	Central	Retain			Included bark; gypsy moth; stem compartmentalized around rope; hanger; epicormic growth.
2850	Silver Maple	*Acer saccharinum*	Native	1	66.5	6.0	Possible	Fair	Central	Retain			Large codominant leaders; history of branch failure; epicormic growth.
2851	White Spruce	*Picea glauca*	Native	1	31.1	3.5	Improbable	Good	Central	Retain			History of branch pruning.
2852	Manitoba Maple	*Acer negundo*	Native	2	23.0	4.0	Improbable	Fair	Central	Retain			Codominant stems; 'layered' from downed branch of neighbouring tree; leaning southeast; vine in crown.
2853	Manitoba Maple	*Acer negundo*	Native	4	135.0	11.0	Possible	Poor	Central	Retain			Asymmetrical crown due north, comprised of stems parallel to ground; large water sprouts rerooting to ground; epicormic growth; included bark; cavities; rot; large broken stem resting on ground, rotting, partially attached.
2854	Hawthorn species	*Crataegus sp.*	Native	3	75.0	4.5	Possible	Fair	Central	Retain			Past failure, centre rot; poor structure; vine in crown.
2855	Hawthorn species	*Crataegus sp.*	Native	6	13.7	2.5	Possible	Fair	Central	Retain			Crown thinning; history of branch failure; many small stems.
2856	Hawthorn species	*Crataegus sp.*	Native	3	36.0	4.0	Possible	Poor	Central	Retain			Branch rub; epicormic growth; included bark; suppressed.
2857	Hawthorn species	*Crataegus sp.*	Native	3	25.0	3.0	Possible	Fair	Central	Retain			Crossing branches; branch failures.
2858	Hawthorn species	*Crataegus sp.*	Native	1	13.3	2.5	Improbable	Fair	Central	Retain			Codominant leaders with included bark; phototrophic growth.
2859	Hawthorn species	*Crataegus sp.*	Native	2	48.0	5.0	Improbable	Fair	Central	Retain			Stem lean east; asymmetrical crown due east; included bark; compartmentalized wounds; basal cavity; knot holes.
2860	Common Apple	*Malus domestica*	Non-Native	1	44.0	4.0	Possible	Fair	Central	Retain			Stem lean east; asymmetrical crown due east; dieback; hangers; vines; compartmentalized wounds; epicormic growth.
2861	Hawthorn species	*Crataegus sp.*	Native	8	29.0	3.5	Possible	Fair	Central	Retain			Many-stemmed, dense form; fencewire through stem; history of branch failure.
2862	Hawthorn species	*Crataegus sp.*	Native	1	12.5	3.0	Possible	Poor	Central	Retain			Stem lean east; asymmetrical crown due east; vines; water sprouts; branch rub; suppressed.
2863	Black Walnut	*Juglans nigra*	Native	1	23.6	4.0	Improbable	Fair	Central	Retain			Crooked stem; vine in crown.
2864	Hawthorn species	*Crataegus sp.*	Native	1	12.8	0.5	Probable	Dead	Central	Remove	Condition	No	Broken top.
2865	Hawthorn species	*Crataegus sp.*	Native	3	10.4	2.5	Possible	Poor	Central	Retain			Leaning east; unbalanced, suppressed crown.
2866	Hawthorn species	*Crataegus sp.*	Native	6	67.0	5.0	Possible	Poor	Central	Retain			Stem lean east; asymmetrical crown due east; dieback; broken branches.
2867	Black Walnut	*Juglans nigra*	Native	1	31.4	8.0	Improbable	Fair	Central	Retain			Asymmetrical crown due east; vines; included bark.
2868	Black Walnut	*Juglans nigra*	Native	1	12.2	2.5	Improbable	Good	Central	Retain			Vine in lower crown.
2869	Black Walnut	*Juglans nigra*	Native	1	21.9	3.5	Improbable	Good	Central	Retain			Codominant leaders; vine in lower crown; tent caterpillar.
2870	White Ash	*Fraxinus americana*	Native	2	11.0	2.0	Possible	Fair	East A	Retain			Crack between codominant stems; healthy crown.
2871	White Ash	*Fraxinus americana*	Native	2	18.0	2.5	Improbable	Good	East A	Retain			Full, vigorous crown; no sign of EAB.
2872	Common Apple	*Malus domestica*	Non-Native	5	120.0	4.0	Improbable	Fair	East A	Retain			1 stem dead; 5 dead branches; water sprouts; vine in crown.
2873	Common Apple	*Malus domestica*	Non-Native	5	139.0	6.0	Possible	Fair	East A	Retain			Some limb dieback and crown dieback; however response growth in upper crown; riverbank grape throughout lower scaffold branches; fruit production.

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2874	Common Apple	*Malus domestica*	Non-Native	3	80.0	3.5	Possible	Fair	East A	Retain			Centre rot in at least 1 stem; declining main branches, live water sprouts; shedding some bark; vine in crown.
2875	Black Willow	*Salix nigra*	Native	1	14.5	5.0	Improbable	Good	East A	Retain			Full, well distributed crown; small branch rub on main stem; virginia creeper in lower scaffold branches.
2876	Common Apple	*Malus domestica*	Non-Native	4	85.0	4.0	Possible	Fair	East A	Retain			Crooked branches per management style; history of branch failure; dead branches; vine in crown.
2877	Common Apple	*Malus domestica*	Non-Native	3	83.0	6.0	Possible	Poor	East A	Retain			Open cavity on main stem with decay; large limb dead in lower scaffold could be pruned; some crown dieback; fruit production.
2878	Common Apple	*Malus domestica*	Non-Native	5	151.0	4.5	Possible	Poor	East A	Retain			10% dieback; history of branch failure; water sprouts; dead branches.
2879	White Ash	*Fraxinus americana*	Native	1	10.9	3.5	Improbable	Good	East A	Retain			Slightly asymmetrical crown due to adjacent tree; crown otherwise vigorous; small fresh branch scrape with ants; no signs of EAB.
2880	Common Apple	*Malus domestica*	Non-Native	1	50.0	3.5	Possible	Poor	East A	Retain			3 dead or dying branches; 50% live crown lost; vine in crown.
2881	Black Walnut	*Juglans nigra*	Native	1	10.9	4.0	Improbable	Good	East A	Retain			Slightly asymmetrical crown due to adjacent apple tree; crown otherwise vigorous.
2882	Common Apple	*Malus domestica*	Non-Native	1	32.0	3.0	Possible	Poor	East A	Retain			Extensive crown dieback; large, open cavity on lower stem with decay; history of branch failure; almost dead.
2883	Manitoba Maple	*Acer negundo*	Native	1	16.7	2.5	Improbable	Fair	East A	Retain			Wilted leaves, drought stress; vine in crown; codominant leaders.
2884	Norway Maple	*Acer platanoides*	Non-Native	2	21.0	2.0	Improbable	Fair	East A	Retain			Several smaller stems; minor tar spot; reverted green from Crimson King.
2885	Manitoba Maple	*Acer negundo*	Native	3	33.0	4.0	Improbable	Fair	East A	Retain			Upright growth with relatively good form for species; minor dieback; heavy seed production; riverbank grape in lower scaffold branches.
2886	Common Apple	*Malus domestica*	Non-Native	1	57.7	6.0	Improbable	Poor	East A	Retain			Some crown dieback with most in lower scaffold branches; epicormic growth; riverbank grape throughout; water sprouts.
2887	Manitoba Maple	*Acer negundo*	Native	1	16.2	2.5	Improbable	Good	East A	Retain			Good form; full crown with minor light pruning; vine in crown.
2888	Common Apple	*Malus domestica*	Non-Native	1	56.9	4.0	Possible	Fair	East A	Retain			Crooked branches; natural graft; large water sprouts; history of branch failure.
2889	Common Apple	*Malus domestica*	Non-Native	1	52.8	6.5	Possible	Poor	East A	Retain			Main stem and 1 large scaffold branch hollow; water sprouts; draped in riverbank grape.
2890	Common Apple	*Malus domestica*	Non-Native	1	61.2	4.5	Possible	Poor	East A	Retain			15% dieback; history of branch failure; water sprouts; many fruiting bodies at base.
2891	Black Walnut	*Juglans nigra*	Native	1	15.9	4.0	Improbable	Fair	East A	Retain			Slightly asymmetrical crown due to adjacent tree; minor dieback; 1 canker beginning on main stem.
2892	Common Apple	*Malus domestica*	Non-Native	1	43.7	3.0	Probable	Poor	East A	Remove	Condition	Yes	Very little live crown; missing most bark.
2893	Common Apple	*Malus domestica*	Non-Native	1	50.7	4.0	Possible	Fair	East A	Retain			History of significant branch failures; light pruning; good fruit set.
2894	White Ash	*Fraxinus americana*	Native	1	11.3	2.5	Improbable	Fair	East A	Retain			Relatively vigorous crown; epicormic growth; wound on main stem with compartmentalization.
2895	Common Apple	*Malus domestica*	Non-Native	1	53.9	5.0	Improbable	Fair	East A	Retain			Some crown dieback; decay in 1 lower scaffold branch; water sprouts; fruit production.
2896	Common Apple	*Malus domestica*	Non-Native	1	54.0	4.0	Possible	Fair	East A	Retain			History of branch failure; conks; water sprouts; minor dieback.
2897	Common Apple	*Malus domestica*	Non-Native	1	45.8	3.5	Possible	Poor	East A	Retain			3 dead scaffold branches; dieback; vine in crown.
2898	Common Apple	*Malus domestica*	Non-Native	1	47.9	5.0	Possible	Poor	East A	Retain			2 leader snapped; relatively extensive crown dieback; decay in lower scaffold branches; draped in riverbank grape.
2899	Common Apple	*Malus domestica*	Non-Native	1	55.4	3.5	Possible	Fair	East A	Retain			Included bark; history of branch failure; epicormic growth; minor dieback.
2900	White Ash	*Fraxinus americana*	Native	1	10.2	2.5	Improbable	Good	East A	Retain			Full, vigorous crown; small bark cracks in upper stem; no sign of EAB.
2901	Black Walnut	*Juglans nigra*	Native	1	10.3	2.0	Improbable	Good	East A	Retain			Good structure but for 1 branch angle.
2902	Black Walnut	*Juglans nigra*	Native	1	11.7	2.5	Improbable	Good	East A	Retain			Very minor dieback; straight, solid main stem.
2903	Common Apple	*Malus domestica*	Non-Native	1	50.6	4.0	Possible	Fair	East A	Retain			Dieback; history of branch failure; vine in crown.
2904	Common Apple	*Malus domestica*	Non-Native	1	57.7	6.0	Improbable	Fair	East A	Retain			Some crown dieback; water sprouts; some light pruning and decay in lower scaffold branches; could benefit from structural pruning.
2905	Common Apple	*Malus domestica*	Non-Native	1	56.1	6.0	Improbable	Poor	East A	Retain			Crown dieback and competing with buckthorn; water sprouts; fruit production; some decay in lower scaffold branches.
2906	Bur Oak	*Quercus macrocarpa*	Native	1	17.0	3.0	Improbable	Good	East A	Retain			Full crown, insect defoliation.
2907	Common Apple	*Malus domestica*	Non-Native	1	54.3	4.0	Possible	Fair	East A	Retain			Few dead branches; crooked branches.
2908	Red Oak	*Quercus rubra*	Native	1	47.2	7.0	Improbable	Fair	East A	Retain			Minor dieback; light pruning dieback in lower scaffold branches; slightly asymmetrical crown due adjacent tree; wound on root flare with compartmentalization.
2909	Common Apple	*Malus domestica*	Non-Native	1	35.7	3.5	Improbable	Fair	East A	Retain			Swollen tissue in stem; light pruning; vine in crown.
2910	Black Cherry	*Prunus serotina*	Native	3	76.0	4.0	Possible	Fair	East A	Retain			Unbalanced crown; lower scaffold branches competing with maple; evidence of decay at stem union.
2911	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	19.8	4.0	Improbable	Fair	East A	Retain			Sharing root flare with cherry; crown growing up through cherry; stem straight and solid.
2912	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	13.5	3.0	Improbable	Good	East A	Retain			Once lost leader, codominants arose; vine up stem; minor epicormic growth.
2913	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	13.3	3.0	Improbable	Good	East A	Retain			Full crown; vine up stem.
2914	Red Oak	*Quercus rubra*	Native	3	59.0	7.0	Improbable	Good	East A	Retain			Minor dieback only; smallest stem with fruiting bodies and crown dieback; could benefit from pruning.
2915	Red Oak	*Quercus rubra*	Native	1	10.4	2.0	Improbable	Good	East A	Retain			Good vigour; minor epicormic growth.
2916	Red Oak	*Quercus rubra*	Native	1	11.6	2.5	Improbable	Good	East A	Retain			Good vigour; once lost leader.
2917	Red Oak	*Quercus rubra*	Native	1	21.7	6.0	Improbable	Good	East A	Retain			Slightly asymmetrical crown due to adjacent tree; crown otherwise vigorous; light pruning in lower scaffold branches.

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Location	Proposed Action	Rationale for Removal	Compensation Required	Comments
2918	Sweet Cherry	*Prunus avium*	Non-Native	3	60.0	4.0	Improbable	Good	East A	Retain			Slightly asymmetrical crown due to adjacent tree; crown otherwise vigorous; wound on lower stem with staining and compartmentalization.
2919	Red Oak	*Quercus rubra*	Native	1	17.9	4.0	Improbable	Good	East A	Retain			Asymmetrical crown due to neighboring tree; insect defoliation; minor dieback.
2920	Red Oak	*Quercus rubra*	Native	3	66.0	4.5	Improbable	Fair	East A	Retain			Codominant stems; water pooled in space between stems; power lines through crown; 2 stems once lost leader, now have crooked stem/oversized branch.
2921	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	17.2	3.0	Improbable	Good	East A	Retain			Some riverbank grape in lower scaffold branches; crown relatively vigorous; balanced root flare.
2922	Red Oak	*Quercus rubra*	Native	1	20.9	3.5	Improbable	Fair	East A	Retain			Oversized scaffold branch; power lines through crown; minor epicormic growth.
2923	Red Oak	*Quercus rubra*	Native	3	47.0	5.0	Improbable	Fair	East A	Retain			Light pruning in lower scaffold branches; telephone wires running through crown; minor insect defoliation.
2924	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	14.0	5.0	Possible	Fair	East A	Retain			Irregular growth form; crown almost entirely suppressed by riverbank grape but still only minor dieback.
2925	Black Walnut	*Juglans nigra*	Native	1	14.3	3.0	Improbable	Good	East A	Retain			Asymmetrical crown due to neighboring tree; codominant leaders with tight union; vine in lower crown.
2926	Black Walnut	*Juglans nigra*	Native	1	11.1	3.5	Improbable	Good	East A	Retain			Slightly suppressed due to adjacent tree; riverbank grape in lower scaffold branches; minor dieback.
2927	Black Walnut	*Juglans nigra*	Native	1	16.2	3.5	Improbable	Good	East A	Retain			Good structure.
2928	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	15.6	3.0	Improbable	Good	East A	Retain			Dead sapwood revealed by stem wound not fully closed, but good woundwood; vine in crown.
2929	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	17.2	5.0	Improbable	Good	East A	Retain			Asymmetrical crown as competing with buckthorn; slightly unbalanced root flare; minor dieback; remove buckthorn and tree likely to balance.
2930	Common Apple	*Malus domestica*	Non-Native	1	81.1	4.0	Possible	Fair	East A	Retain			6 dead branches; water sprouts; shedding some bark.
2931	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	24.1	5.0	Improbable	Fair	East A	Retain			2 stems that have fused together with potentially weaker union; slightly asymmetrical crown due to adjacent tree; crown otherwise vigorous.
2932	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	21.4	3.0	Improbable	Good	East A	Retain			Round crown; lower branches maybe epicormic.
2933	Common Apple	*Malus domestica*	Non-Native	1	74.8	6.0	Possible	Poor	East A	Retain			A few larger branches with decay; water sprouts; crown dieback.
2934	Black Walnut	*Juglans nigra*	Native	1	20.0	4.0	Improbable	Good	East A	Retain			Full, open growth crown; seed production.
2935	Black Spruce	*Picea mariana*	Native	1	12.4	2.0	Improbable	Good	East A	Retain			1 tight branch angle; vine in crown.
2936	Common Apple	*Malus domestica*	Non-Native	1	54.4	6.0	Possible	Poor	East A	Retain			Cavity between branch union with decay; crown dieback; riverbank grape in lower scaffold branches.
2937	Common Apple	*Malus domestica*	Non-Native	1	38.2	3.5	Possible	Fair	East A	Retain			Centre rot; past stem failures; crooked branches; vine in crown; few dead branches.
2938	Common Apple	*Malus domestica*	Non-Native	1	48.0	5.0	Improbable	Poor	East A	Retain			Some crown dieback; riverbank grape throughout one side of tree; epicormic growth.
2939	Crack Willow	*Salix fragilis*	Non-Native	1	12.1	1.5	Improbable	Fair	East A	Retain			Corrected lean; minor dieback; orange fungus on underside of leaves.
2940	Black Walnut	*Juglans nigra*	Native	1	11.7	2.5	Improbable	Good	East A	Retain			Good structure.
2941	Black Walnut	*Juglans nigra*	Native	1	15.1	4.0	Improbable	Good	East A	Retain			Full, open growth crown; straight, solid main stem.
2942	Common Apple	*Malus domestica*	Non-Native	1	45.0	5.0	Possible	Poor	East A	Retain			Decay in 3 large branches; crown dieback; draped in riverbank grape.
2943	Red Oak	*Quercus rubra*	Native	2	52.0	6.0	Improbable	Good	East A	Retain			Minor dieback and insect defoliation.
2944	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	11.0	3.0	Improbable	Fair	East A	Retain			One sided, suppressed crown due to adjacent tree; minor dieback; riverbank grape in lower scaffold branches.
2945	Black Walnut	*Juglans nigra*	Native	1	10.3	3.0	Improbable	Good	East A	Retain			Strong leader; good structure.
2946	Bur Oak	*Quercus macrocarpa*	Native	1	12.0	0.5	Possible	Poor	East A	Retain			Leader missing; extensive dieback.
2947	Red Oak	*Quercus rubra*	Native	1	35.6	7.0	Improbable	Fair	East A	Retain			Well distributed crown with only minor dieback; straight, solid main stem; self correcting root flare.
2948	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	25.9	6.0	Improbable	Good	East A	Retain			Well distributed, vigorous crown; light pruning only; straight, solid main stem.
2949	Black Walnut	*Juglans nigra*	Native	1	11.2	4.0	Improbable	Good	East A	Retain			Slightly asymmetrical crown due to adjacent tree; crown otherwise vigorous.
2950	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	10.5	2.0	Improbable	Poor	East A	Retain			Very narrow crown with growth mostly only at top; draped in riverbank grape.
2951	Common Apple	*Malus domestica*	Non-Native	1	71.3	5.0	Possible	Poor	East A	Retain			Centre rot; sapwood decay, fruiting bodies; history of branch failure; epicormic growth.
2952	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	13.9	2.5	Improbable	Fair	East A	Retain			Narrow, asymmetrical crown; riverbank grape in lower scaffold branches.
2953	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	10.3	1.5	Improbable	Fair	East A	Retain			Stem wound partly closed; branch rubbing; suppressed crown.
2954	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	14.3	2.5	Improbable	Good	East A	Retain			Lower scaffold competing with buckthorn; crown otherwise healthy.
2955	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	19.7	3.5	Improbable	Good	East A	Retain			Vigorous growth.
2956	Common Apple	*Malus domestica*	Non-Native	1	68.3	6.0	Possible	Poor	East A	Retain			Epicormic growth; extensive decay in branches; crown dieback.
2957	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	11.8	2.0	Improbable	Fair	East A	Retain			Branch rubbing wound.
2958	White Ash	*Fraxinus americana*	Native	1	13.2	2.0	Improbable	Good	East A	Retain			Healthy crown, strong leader.
2959	Common Apple	*Malus domestica*	Non-Native	1	66.0	5.0	Possible	Poor	East A	Retain			Most upper branches snapped with decay; main stem hollow; epicormic growth.

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2960	Common Apple	*Malus domestica*	Non-Native	1	76.5	4.0	Possible	Fair	East A	Retain			Centre rot in main stem; history of branch failure; fruiting bodies inside cavity.
2961	Black Walnut	*Juglans nigra*	Native	1	14.9	3.5	Improbable	Good	East A	Retain			Light pruning in lower scaffold branches; lower scaffold competing with tartarian honeysuckle; solid main stem.
2962	Common Apple	*Malus domestica*	Non-Native	5	52.0	4.0	Possible	Poor	East A	Retain			Dense coppiced growth from around dead former main stem; vine in crown.
2963	Black Walnut	*Juglans nigra*	Native	1	11.6	3.5	Improbable	Good	East A	Retain			Growing out of dogwood thicket; minor dieback only; solid main stem.
2964	Black Walnut	*Juglans nigra*	Native	1	12.4	2.5	Improbable	Good	East A	Retain			Good fruit set.
2965	Common Apple	*Malus domestica*	Non-Native	1	55.1	4.5	Possible	Poor	East A	Retain			Centre rot; basal rot, fruiting bodies; history of branch failure; vine heavy in crown.
2966	Bur Oak	*Quercus macrocarpa*	Native	1	21.1	3.5	Improbable	Fair	East A	Retain			Some insect defoliation; narrow crown; riverbank grape in lower scaffold branches.
2967	Common Apple	*Malus domestica*	Non-Native	1	26.9	5.0	Improbable	Fair	East A	Retain			Light pruning in lower scaffold branches; some crown dieback; riverbank grape in lower scaffold branches; fruit production.
2968	Common Apple	*Malus domestica*	Non-Native	2	36.0	2.5	Possible	Poor	East A	Retain			Centre rot, frass; 40% dieback; vine in crown.
2969	Black Walnut	*Juglans nigra*	Native	1	12.6	3.0	Improbable	Good	East A	Retain			Once lost leader, 3 branches take place in upper stem.
2970	Black Walnut	*Juglans nigra*	Native	1	11.9	3.0	Improbable	Fair	East A	Retain			Suppressed crown due to adjacent tree; asymmetrical; riverbank grape in lower scaffold branches.
2971	Black Walnut	*Juglans nigra*	Native	1	11.0	2.5	Possible	Poor	East A	Retain			Narrow crown with most of leader missing or suppressed by riverbank grape.
2972	Black Walnut	*Juglans nigra*	Native	1	11.8	2.5	Improbable	Good	East A	Retain			Good form; high crown with power lines through.
2973	Eastern Red Cedar	*Juniperus virginiana*	Native	1	12.8	1.0	Improbable	Fair	East A	Retain			Asymmetrical crown due to adjacent tree; some crown dieback; riverbank grape throughout.
2974	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	2	25.0	2.5	Improbable	Fair	East A	Retain			Included bark between stem union; narrow crown; riverbank grape in lower scaffold branches.
2975	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	10.1	2.5	Improbable	Fair	East A	Retain			Strong taper, slightly suppressed; minor epicormic growth.
2976	Black Walnut	*Juglans nigra*	Native	1	17.3	3.0	Improbable	Good	East A	Retain			Vine in lower crown.
2977	Black Walnut	*Juglans nigra*	Native	1	14.0	3.0	Improbable	Fair	East A	Retain			Riverbank grape climbing up tree; upper crown still vigorous.
2978	Sweet Cherry	*Prunus avium*	Non-Native	1	22.2	4.0	Improbable	Fair	East A	Retain			Asymmetrical crown due to neighboring trees; oversized scaffold branch; minor gummosis.
2979	White Spruce	*Picea glauca*	Native	1	29.6	2.5	Possible	Poor	East A	Retain			Relatively extensive dieback in lower scaffold branches; riverbank grape up main stem; narrow crown.
2980	White Spruce	*Picea glauca*	Native	1	27.4	2.5	Possible	Poor	East A	Retain			Growing on slight angle; lower limb dieback; riverbank grape throughout.
2981	Sweet Cherry	*Prunus avium*	Non-Native	1	15.6	3.0	Improbable	Fair	East A	Retain			Asymmetrical crown due to neighboring trees; bark seam.
2982	White Spruce	*Picea glauca*	Native	2	30.0	2.5	Possible	Poor	East A	Retain			Primary stem dead; exposed roots; deer rub wound.
2983	Bur Oak	*Quercus macrocarpa*	Native	1	15.0	3.0	Improbable	Poor	East A	Retain			Asymmetrical and suppressed by riverbank grape; insect defoliation.
2984	White Spruce	*Picea glauca*	Native	1	26.4	3.5	Improbable	Good	East A	Retain			Exposed roots; light pruning.
2985	White Oak	*Quercus alba*	Native	1	12.6	3.0	Improbable	Poor	East A	Retain			Stem wound compartmentalized; phototrophic growth with suppressed crown.
2986	White Spruce	*Picea glauca*	Native	1	33.4	3.0	Improbable	Good	East A	Retain			Vine in crown.
2987	White Spruce	*Picea glauca*	Native	1	16.3	2.5	Improbable	Fair	East A	Retain			Narrow crown due to adjacent trees; some light pruning in lower scaffold branches.
2988	Sweet Cherry	*Prunus avium*	Non-Native	1	24.6	3.5	Improbable	Good	East A	Retain			Asymmetrical crown due to neighboring trees.
2989	White Spruce	*Picea glauca*	Native	1	20.5	2.0	Improbable	Fair	East A	Retain			Light pruning up stem due to proximity of adjacent tree; upper crown healthy.
2990	White Spruce	*Picea glauca*	Native	1	35.0	4.0	Improbable	Good	East A	Retain			Slightly narrow crown due to adjacent tree; minor light pruning in lower scaffold branches.
2991	White Spruce	*Picea glauca*	Native	1	44.7	4.5	Improbable	Good	East A	Retain			Slightly crooked stem; vine in crown.
2992	White Spruce	*Picea glauca*	Native	1	18.4	2.0	Improbable	Poor	East A	Retain			One sided, suppressed crown with some dieback.
2993	White Spruce	*Picea glauca*	Native	1	18.1	2.0	Improbable	Fair	East A	Retain			Light pruning; vine in crown.
2994	White Spruce	*Picea glauca*	Native	1	12.4	1.5	Improbable	Fair	East A	Retain			Minor dieback despite growing between 2 adjacent trees.
2995	White Spruce	*Picea glauca*	Native	1	33.0	4.0	Improbable	Fair	East A	Retain			Asymmetrical crown due to adjacent tree; light pruning in lower scaffold branches; small amount of riverbank grape in upper crown.
2996	White Spruce	*Picea glauca*	Native	1	44.0	4.0	Improbable	Good	East A	Retain			Light pruning; good structure.
2997	White Spruce	*Picea glauca*	Native	1	18.3	1.5	Improbable	Poor	East A	Retain			Crown dieback; draped in riverbank grape.
2998	Sweet Cherry	*Prunus avium*	Non-Native	6	95.0	6.0	Improbable	Fair	East A	Retain			Seam up main stem with some wound wood; crown dieback; riverbank grape in lower scaffold branches.
2999	Sweet Cherry	*Prunus avium*	Non-Native	1	13.1	2.5	Improbable	Good	East A	Retain			Healthy crown slightly asymmetrical due to neighboring tree; vine in crown.
3000	White Spruce	*Picea glauca*	Native	1	24.7	3.0	Improbable	Good	East A	Retain			Good fruit set; light pruning.
3001	American Basswood	*Tilia americana*	Native	1	10.1	2.5	Improbable	Fair	East B	Retain			Suppressed crown due to adjacent tree; slight phototrophic growth toward field.
3002	Red Oak	*Quercus rubra*	Native	1	24.5	5.5	Improbable	Good	East B	Retain			Only slightly unbalanced due to adjacent tree; crown otherwise full and vigorous; solid main stem.
3003	American Beech	*Fagus grandifolia*	Native	1	28.2	7.0	Possible	Fair	East B	Retain			10 degree phototrophic lean; evidence of decay at top of root flare.
3004	American Basswood	*Tilia americana*	Native	1	10.9	3.5	Improbable	Fair	East B	Retain			Slightly suppressed crown due to adjacent tree; minor bark cracks.
3005	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	20.5	4.5	Improbable	Fair	East B	Retain			Slight phototrophic growth; root flare partially merged with adjacent tree.
3006	Black Cherry	*Prunus serotina*	Native	1	40.2	6.5	Improbable	Fair	East B	Retain			Self pruning in lower scaffold branches; minor crown dieback.
3007	American Beech	*Fagus grandifolia*	Native	1	15.3	2.0	Improbable	Good	East B	Retain			Minor light pruning in lower scaffold branches; slightly suppressed, otherwise healthy.
3008	American Beech	*Fagus grandifolia*	Native	1	26.8	4.0	Improbable	Good	East B	Retain			Solid main stem; relatively vigorous crown.

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3009	American Beech	*Fagus grandifolia*	Native	1	17.6	3.0	Improbable	Good	East B	Retain			Full, vigorous crown; dead limb from adjacent tree against lower stem.
3010	American Basswood	*Tilia americana*	Native	2	42.0	4.0	Improbable	Fair	East B	Retain			Small stem dead; a few galls on main stem; narrow crown; gypsy moth eggs.
3011	Red Oak	*Quercus rubra*	Native	1	80.7	9.0	Improbable	Good	East B	Retain			Beautiful, mature tree; history of branch failure; could benefit from minor scaffold pruning.
3012	American Basswood	*Tilia americana*	Native	1	19.2	5.0	Possible	Poor	East B	Retain			Main leader dead; canker up main stem.
3013	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	10.4	4.0	Improbable	Good	East B	Retain			Slightly asymmetrical crown due to adjacent tree; crown otherwise healthy.
3014	Red Oak	*Quercus rubra*	Native	1	13.7	3.5	Improbable	Fair	East B	Retain			One sided crown due to adjacent tree; some insect defoliation; light pruning dieback.
3015	American Basswood	*Tilia americana*	Native	1	15.5	3.0	Improbable	Good	East B	Retain			A couple of galls up main stem; relatively vigorous crown.
3016	American Basswood	*Tilia americana*	Native	1	13.5	2.5	Improbable	Fair	East B	Retain			One sided crown due to adjacent tree; some crown dieback.
3017	American Basswood	*Tilia americana*	Native	2	41.0	4.5	Improbable	Good	East B	Retain			Slightly asymmetrical crown due to adjacent tree; crown otherwise full.
3018	American Basswood	*Tilia americana*	Native	1	25.8	0.0	Possible	Dead	East B	Retain			
3019	American Basswood	*Tilia americana*	Native	1	12.6	4.0	Possible	Fair	East B	Retain			Phototrophic lean toward field; bark cracks; minor insect defoliation.
3020	American Basswood	*Tilia americana*	Native	1	10.5	4.0	Possible	Poor	East B	Retain			Main leader gone with decay down cavity; seam up stem with compartmentalization; crown suppressed.
3021	Red Oak	*Quercus rubra*	Native	1	25.7	5.0	Improbable	Good	East B	Retain			Asymmetrical crown due to adjacent tree; crown otherwise vigorous; solid main stem; some insect defoliation.
3022	American Basswood	*Tilia americana*	Native	1	13.6	5.0	Improbable	Fair	East B	Retain			Suppressed and one sided crown due to adjacent tree; some leaf defoliation and discolouration.
3023	American Basswood	*Tilia americana*	Native	1	14.6	4.0	Improbable	Fair	East B	Retain			Phototrophic lean toward field; suppressed, one sided crown due to adjacent tree.
3024	American Basswood	*Tilia americana*	Native	2	46.0	3.0	Improbable	Fair	East B	Retain			Narrow crown on main leader; second stem has full crown; minor dieback.
3025	American Basswood	*Tilia americana*	Native	1	44.1	5.0	Improbable	Fair	East B	Retain			Gypsy moth caterpillar (dead) and eggs; one sided crown due to adjacent tree; some canker up main stem.
3026	Black Cherry	*Prunus serotina*	Native	1	21.4	3.0	Improbable	Fair	East B	Retain			Unbalanced root flare; narrow crown due to competition with adjacent trees; minor crown dieback.
3027	Red Oak	*Quercus rubra*	Native	1	37.4	7.0	Improbable	Fair	East B	Retain			One sided crown due to adjacent tree; gypsy moth eggs; some insect defoliation; solid main stem.
3028	Black Walnut	*Juglans nigra*	Native	1	14.6	4.5	Improbable	Fair	East B	Retain			One sided crown due to adjacent tree; riverbank grape up main stem; minor dieback.
3029	Black Walnut	*Juglans nigra*	Native	1	23.2	5.0	Improbable	Fair	East B	Retain			One sided crown due to adjacent tree; riverbank grape up main stem; could benefit from vine removal and likely will become more vigorous.
3030	White Ash	*Fraxinus americana*	Native	2	37.0	4.0	Possible	Poor	East B	Retain			Woodpecker damage; crown dieback; riverbank grape throughout; history of branch failure.
3031	American Basswood	*Tilia americana*	Native	1	11.5	3.0	Improbable	Fair	East B	Retain			One sided crown due to adjacent tree; light pruning in lower scaffold branches; some insect defoliation.
3032	American Basswood	*Tilia americana*	Native	1	22.2	5.0	Improbable	Good	East B	Retain			Slightly asymmetrical crown due to adjacent tree; crown otherwise full.
3033	Black Cherry	*Prunus serotina*	Native	2	29.0	2.5	Possible	Poor	East B	Retain			Narrow crown with dieback; epicormic growth; canker with sap.
3034	American Basswood	*Tilia americana*	Native	1	20.8	3.0	Improbable	Fair	East B	Retain			Epicormic growth; upper crown full and vigorous.
3035	American Basswood	*Tilia americana*	Native	1	15.9	1.5	Possible	Poor	East B	Retain			Upper portion of crown dead; epicormic growth only.
3036	Black Cherry	*Prunus serotina*	Native	1	16.2	1.0	Possible	Poor	East B	Retain			Very narrow crown; epicormic growth; decay with some insect feeding.
3037	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	31.0	5.0	Improbable	Fair	East B	Retain			Gypsy moth caterpillar and eggs; some potential weak branch unions; decay in side branch with compartmentalization.
3038	Red Oak	*Quercus rubra*	Native	1	52.2	6.0	Improbable	Good	East B	Retain			Solid main stem; full, vigorous crown with only minor dieback; history of branch failure;.
3039	White Ash	*Fraxinus americana*	Native	1	16.6	2.5	Possible	Fair	East B	Retain			Epicormic growth; suppressed crown with dieback; bark cracks.
3040	Black Walnut	*Juglans nigra*	Native	1	34.1	4.0	Improbable	Good	East B	Retain			Minor light pruning in lower scaffold branches; riverbank grape in lower scaffold branches; crown relatively full; could benefit from removal of grape.
3041	Red Oak	*Quercus rubra*	Native	1	21.4	4.0	Improbable	Good	East B	Retain			Slightly asymmetrical crown due to adjacent tree; crown otherwise full; small amount of riverbank grape in lower scaffold branches.
3042	Red Oak	*Quercus rubra*	Native	1	40.7	7.0	Improbable	Good	East B	Retain			Wide, open grown canopy with minimal dieback; solid main stem; retain.
3043	Black Walnut	*Juglans nigra*	Native	1	62.4	7.0	Improbable	Good	East B	Retain			Wide, open grown canopy with minor dieback; history of branch failure in lower scaffold; riverbank grape starting to grow in lower scaffold branches.
3044	Crack Willow	*Salix fragilis*	Non-Native	3	168.0	4.0	Improbable	Good	East B	Retain			Narrow crown for species but vigorous; solid stems; minor epicormic growth.
3045	Bitternut Hickory	*Carya cordiformis*	Native	2	57.0	4.0	Possible	Poor	East B	Retain			Lower scaffold branches draped in riverbank grape; limb dieback in upper crown with some bark loss.
3046	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	50.2	6.0	Possible	Poor	East B	Retain			Evidence of decay in old prune cuts; some limb dieback in upper crown; sapsucker damage.
3047	American Beech	*Fagus grandifolia*	Native	1	16.4	3.0	Possible	Fair	East B	Retain			Suppressed, slightly asymmetrical crown due to adjacent tree; 1 scaffold dead with decay.
3048	American Beech	*Fagus grandifolia*	Native	1	18.7	3.5	Possible	Poor	East B	Retain			Weak branch union between codominant stems; crown dieback; bark cracks; some decay on main stem.
3049	American Basswood	*Tilia americana*	Native	1	30.4	5.0	Possible	Fair	East B	Retain			Phototrophic lean; branch rub on main stem; some crown dieback; canker up main stem.
3050	American Basswood	*Tilia americana*	Native	1	18.5	2.0	Possible	Poor	East B	Retain			Suppressed crown with dieback; branch rubs on main stem.
3051	American Beech	*Fagus grandifolia*	Native	1	10.4	4.0	Improbable	Fair	East B	Retain			Phototrophic growth in upper crown; suppressed due to adjacent tree.
3052	American Beech	*Fagus grandifolia*	Native	4	56.0	7.0	Possible	Poor	East B	Retain			2 stems dead; crown dieback; insect feeding; woodpecker damage.

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Location	Proposed Action	Rationale for Removal	Compensation Required	Comments
3053	American Basswood	*Tilia americana*	Native	1	15.8	5.0	Possible	Fair	East B	Retain			20 degree phototrophic lean toward field; canker up main stem; suppressed due to adjacent tree.
3054	Red Oak	*Quercus rubra*	Native	1	43.0	7.0	Improbable	Good	East B	Retain			Slightly asymmetrical crown due to adjacent tree; crown otherwise full; self correcting root flare.
3055	American Basswood	*Tilia americana*	Native	1	14.5	2.0	Possible	Poor	East B	Retain			Crown suppressed with dieback; split up main stem with decay and gypsy moth eggs; canker.
3056	American Basswood	*Tilia americana*	Native	1	27.5	3.0	Possible	Poor	East B	Retain			Phototrophic lean; suppressed, narrow crown with dieback; decay in old limb loss wound.
3057	Red Oak	*Quercus rubra*	Native	1	48.8	6.0	Improbable	Good	East B	Retain			Wide, full crown with minor dieback; straight, solid main stem; beautiful mature tree.
3058	Red Oak	*Quercus rubra*	Native	1	27.7	5.5	Improbable	Fair	East B	Retain			Slightly asymmetrical crown and suppressed a bit by adjacent tree; minor dieback; straight, solid main stem.
3060	American Basswood	*Tilia americana*	Native	1	78.9	6.0	Probable	Poor	East B	Remove	Condition	Yes	Large, open cavity up stem that starts at root flare; carpenter ants; crown dieback; wildlife tree.
3061	Hawthorn species	*Crataegus sp.*	Native	1	13.4	4.0	Improbable	Good	East B	Retain			Slightly suppressed due to adjacent tree; crown otherwise full; minor dieback.
3062	Hawthorn species	*Crataegus sp.*	Native	1	21.0	5.0	Possible	Poor	East B	Retain			Cavity in main stem with decay; 1 large scaffold dead.
3063	American Basswood	*Tilia americana*	Native	1	43.5	5.0	Possible	Poor	East B	Retain			Wound on up main stem with decay; one sided crown with dieback; woodpecker damage.
3064	Bur Oak	*Quercus macrocarpa*	Native	1	15.5	1.0	Possible	Poor	East B	Retain			Narrow crown with dieback and epicormic growth up main stem.
3065	American Basswood	*Tilia americana*	Native	2	116.0	6.0	Improbable	Fair	East B	Retain			Fairly wide, full crown; minor evidence of decay in upper limb wound.
3066	American Basswood	*Tilia americana*	Native	2	70.0	8.0	Possible	Fair	East B	Retain			Open cavity at root flare between 2 stems with decay up 1 stem; some compartmentalization; crown dieback.
3067	Hawthorn species	*Crataegus sp.*	Native	3	35.0	4.0	Possible	Poor	East B	Retain			Suppressed due to adjacent tree and riverbank grape; crown dieback; epicormic growth.
3068	Hawthorn species	*Crataegus sp.*	Native	2	11.5	4.0	Possible	Poor	East B	Retain			Crown dieback; decay; suppressed crown; epicormic growth.
3069	American Basswood	*Tilia americana*	Native	4	129.0	7.0	Possible	Fair	East B	Retain			Some crown dieback; 1 stem poor with relatively extensive decay.
3070	Black Walnut	*Juglans nigra*	Native	1	14.7	2.5	Improbable	Good	East B	Retain			Good structure; vine in crown.
3071	Black Walnut	*Juglans nigra*	Native	1	14.6	3.0	Improbable	Good	East B	Retain			Minor dieback; some grape in lower scaffold branches.
3072	Black Walnut	*Juglans nigra*	Native	1	13.0	3.0	Improbable	Good	East B	Retain			Very minor dieback; minimal riverbank grape in lower scaffold branches.
3073	Common Apple	*Malus domestica*	Non-Native	1	36.0	3.5	Possible	Poor	East B	Retain			Loose bark, insect galleries; dieback; dense, crooked branches.
3074	Black Walnut	*Juglans nigra*	Native	1	12.0	3.0	Improbable	Fair	East B	Retain			Light pruning; asymmetrical crown due west.
3075	American Basswood	*Tilia americana*	Native	1	17.4	4.0	Improbable	Fair	East B	Retain			Stem lean east; asymmetrical crown due west; cavity.
3076	Common Pear	*Pyrus communis*	Non-Native	1	14.0	3.0	Possible	Poor	East B	Retain			Asymmetrical crown due east; dieback; suppressed; cavities.
3077	American Basswood	*Tilia americana*	Native	1	14.5	5.5	Improbable	Fair	East B	Retain			Stem lean west; asymmetrical crown due west; light pruning; suppressed.
3078	American Basswood	*Tilia americana*	Native	2	90.0	7.0	Possible	Poor	East B	Retain			Large stem dead, rotted away, 3m tall; compartmentalized wounds, some rot; broken top; asymmetrical crown due west.
3079	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	39.4	6.0	Improbable	Good	East B	Retain			Light pruning; epicormic growth.
3080	American Basswood	*Tilia americana*	Native	1	33.5	8.0	Possible	Poor	East B	Retain			Basal wound with rot; poison ivy; codominant leaders, one dead.
3081	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	18.3	4.0	Improbable	Good	East B	Retain			Slightly suppressed; asymmetrical crown due west.
3082	American Basswood	*Tilia americana*	Native	1	18.5	4.0	Improbable	Fair	East B	Retain			Light pruning; asymmetrical crown due west.
3083	American Basswood	*Tilia americana*	Native	3	77.0	6.5	Possible	Fair	East B	Retain			Drooping branches; asymmetrical crown due west; canker; cavities.
3084	American Basswood	*Tilia americana*	Native	1	12.0	4.0	Possible	Poor	East B	Retain			Stem lean, phototrophic growth; asymmetrical crown due west.
3085	American Basswood	*Tilia americana*	Native	1	44.0	8.0	Improbable	Fair	East B	Retain			Asymmetrical crown due west; branch rub; phototrophic growth.
3086	American Basswood	*Tilia americana*	Native	2	70.0	8.0	Improbable	Fair	East B	Retain			Asymmetrical crown due west; branch rub; phototrophic growth.
3087	Hawthorn species	*Crataegus sp.*	Native	1	13.9	3.5	Improbable	Fair	East B	Retain			Asymmetrical crown due west; light pruning; suppressed.
3088	American Beech	*Fagus grandifolia*	Native	1	19.0	5.5	Improbable	Fair	East B	Retain			Asymmetrical crown due west; light pruning.
3089	American Basswood	*Tilia americana*	Native	1	41.5	8.5	Improbable	Fair	East B	Retain			Light pruning; dead stem resting in branches; textured bark.
3090	American Basswood	*Tilia americana*	Native	1	11.8	4.5	Possible	Poor	East B	Retain			Asymmetrical crown due west; suppressed; vines.
3091	American Basswood	*Tilia americana*	Native	1	21.5	6.0	Improbable	Fair	East B	Retain			Asymmetrical crown due west; suppressed; phototrophic growth.
3092	American Beech	*Fagus grandifolia*	Native	1	28.3	6.5	Improbable	Fair	East B	Retain			Asymmetrical crown due west; light pruning; slightly suppressed.
3093	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	32.0	5.0	Improbable	Good	East B	Retain			Asymmetrical crown due east; light pruning.
3094	American Basswood	*Tilia americana*	Native	2	96.0	9.0	Improbable	Fair	East B	Retain			Main stem hallow, wildlife tree; compartmentalized wound at cavity opening; branch rub.
3095	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	21.4	6.5	Improbable	Good	East B	Retain			Asymmetrical crown due west; branch rub; slightly suppressed.
3096	Hawthorn species	*Crataegus sp.*	Native	1	12.6	3.0	Possible	Poor	East B	Retain			Suppressed; dieback; asymmetrical crown due west.
3097	Black Cherry	*Prunus serotina*	Native	1	41.8	7.0	Possible	Fair	East B	Retain			Stem lean north; resting on adjacent tree; some crown dieback; asymmetrical crown due west.
3098	American Basswood	*Tilia americana*	Native	1	29.5	6.5	Improbable	Fair	East B	Retain			Stem abuts adjacent Black Cherry; asymmetrical crown due west; slightly suppressed; phototrophic growth.
3099	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	36.0	6.5	Improbable	Good	East B	Retain			Branch rub; light pruning.
3100	American Basswood	*Tilia americana*	Native	1	42.2	5.5	Improbable	Fair	East B	Retain			Canker; cavities; compartmentalized wounds.
3101	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	30.1	6.5	Possible	Fair	East B	Retain			Stem lean west; asymmetrical crown due west; suppressed.

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Location	Proposed Action	Rationale for Removal	Compensation Required	Comments
3102	Swamp Serviceberry	*Amelanchier canadensis*	Native	1	57.3	8.0	Improbable	Good	East B	Retain			Sapsucker holes; branch rub; compartmentalized wounds.
3103	American Basswood	*Tilia americana*	Native	1	23.5	5.0	Possible	Fair	East B	Retain			Stem lean north; asymmetrical crown due west; vines; canker.
3104	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	26.5	5.0	Improbable	Good	East B	Retain			Asymmetrical crown due east; branch rub.
3105	American Basswood	*Tilia americana*	Native	1	28.3	5.0	Possible	Poor	East B	Retain			Asymmetrical crown due west; rot major dieback.
3106	Unknown		Native	1	32.5	0.5	Probable	Dead	East B	Remove	Condition	No	No top, vines.
3107	Black Cherry	*Prunus serotina*	Native	1	51.8	3.0	Possible	Poor	East B	Retain			Major dieback; rot; epicormic growth.
3108	American Basswood	*Tilia americana*	Native	2	67.0	6.0	Possible	Fair	East B	Retain			Stem lean west; asymmetrical crown due west; branch rub; hanger.
3109	Manitoba Maple	*Acer negundo*	Native	1	13.7	3.0	Improbable	Fair	East B	Retain			Stem lean west; asymmetrical crown due west; light pruning.
3110	American Basswood	*Tilia americana*	Native	2	38.0	4.5	Improbable	Fair	East B	Retain			Stem lean west; asymmetrical crown due west; light pruning; branch rub.
3111	White Oak	*Quercus alba*	Native	1	61.0	8.0	Improbable	Good	East B	Retain			Light pruning; minor dieback; dead leaf cluster.
3112	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	22.2	5.0	Improbable	Fair	East B	Retain			Asymmetrical crown due west; branch rub; slightly suppressed.
3113	Black Cherry	*Prunus serotina*	Native	1	37.0	8.0	Possible	Fair	East B	Retain			Stem lean west; asymmetrical crown due west; phototrophic growth.
3114	Hop Hornbeam	*Ostrya virginiana*	Native	1	27.1	6.0	Improbable	Fair	East B	Retain			Asymmetrical crown due west; suppressed; light pruning.
3115	Eastern White Pine	*Pinus strobus*	Native	1	59.6	5.0	Improbable	Good	East B	Retain			Light pruning.
3116	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	49.0	6.5	Improbable	Fair	East B	Retain			Asymmetrical crown due east; phototrophic growth; sapsucker holes.
3117	Hop Hornbeam	*Ostrya virginiana*	Native	1	18.8	4.0	Improbable	Fair	East B	Retain			Asymmetrical crown due west; dieback; suppressed.
3118	American Basswood	*Tilia americana*	Native	1	25.5	6.0	Improbable	Fair	East B	Retain			Asymmetrical crown due west; suppressed crown.
3119	Manitoba Maple	*Acer negundo*	Native	1	13.5	4.0	Possible	Fair	East B	Retain			Stem lean west; asymmetrical crown due west; epicormic growth.
3120	Hop Hornbeam	*Ostrya virginiana*	Native	1	25.0	6.5	Improbable	Fair	East B	Retain			Asymmetrical crown due west; light pruning; slightly suppressed.
3121	Hop Hornbeam	*Ostrya virginiana*	Native	1	19.7	4.5	Improbable	Fair	East B	Retain			Asymmetrical crown due west; slightly suppressed.
3122	Hop Hornbeam	*Ostrya virginiana*	Native	1	50.5	7.5	Possible	Poor	East B	Retain			Dieback; epicormic growth; crack in stem; dead leaders.
3123	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	11.7	2.5	Improbable	Good	East B	Retain			Light pruning; slightly suppressed.
3124	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	18.5	7.0	Improbable	Fair	East B	Retain			Asymmetrical crown due west; slightly suppressed; light pruning.
3125	American Basswood	*Tilia americana*	Native	1	28.9	4.0	Improbable	Fair	East B	Retain			Basal cavity; compartmentalized wound, some rot; canker.
3126	American Basswood	*Tilia americana*	Native	1	22.7	3.0	Possible	Poor	East B	Retain			Asymmetrical crown due east; phototrophic growth; suckering.
3127	American Basswood	*Tilia americana*	Native	3	115.0	8.5	Possible	Fair	East B	Retain			Two small stems with major dieback; included bark; canker; asymmetrical crown due west.
3128	Black Cherry	*Prunus serotina*	Native	1	30.2	6.0	Possible	Fair	East B	Retain			Stem lean west; asymmetrical crown due west; phototrophic growth; branch rub.
3129	Manitoba Maple	*Acer negundo*	Native	1	23.1	3.0	Improbable	Fair	East B	Retain			Stem lean west; asymmetrical crown due west; light pruning.
3130	Black Cherry	*Prunus serotina*	Native	1	31.5	8.0	Improbable	Fair	East B	Retain			Stem lean west; asymmetrical crown due west; slightly suppressed.
3131	Hop Hornbeam	*Ostrya virginiana*	Native	1	12.4	3.0	Improbable	Fair	East B	Retain			Asymmetrical crown due west; slightly suppressed.
3132	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	100.0	12.0	Probable	Poor	East B	Retain			Cavities; dieback; knot hole cavities; cracks; history of branch failure; hangers.
3133	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	17.1	5.0	Improbable	Fair	East B	Retain			Asymmetrical crown due west; slightly suppressed; light pruning.
3134	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	22.7	6.0	Possible	Fair	East B	Retain			Asymmetrical crown due west; compartmentalized wounds; vines; hangers.
3135	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	17.1	6.0	Improbable	Good	East B	Retain			Asymmetrical crown due west; compartmentalized wounds; slightly suppressed.
3136	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	17.9	6.0	Improbable	Good	East B	Retain			Asymmetrical crown due west; slightly suppressed.
3137	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	29.3	5.0	Improbable	Good	East B	Retain			Asymmetrical crown due west; light pruning.
3138	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	27.5	5.0	Improbable	Fair	East B	Retain			Asymmetrical crown due west; light pruning; slightly suppressed; codominant leaders; included bark.
3139	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	38.4	5.0	Possible	Dead	East B	Retain			Vines; crown intact.
3140	Manitoba Maple	*Acer negundo*	Native	3	51.0	4.5	Improbable	Fair	East B	Retain			Asymmetrical crown due west; stem lean west; epicormic growth.
3141	White Willow	*Salix alba*	Non-Native	1	41.1	6.0	Improbable	Good	East B	Retain			Light pruning.
3142	Manitoba Maple	*Acer negundo*	Native	1	13.1	4.0	Improbable	Fair	East B	Retain			Stem lean west; asymmetrical crown due west; epicormic growth.
3143	American Basswood	*Tilia americana*	Native	1	17.5	3.0	Possible	Fair	East B	Retain			Suppressed; vines; dieback.
3144	Manitoba Maple	*Acer negundo*	Native	1	13.0	2.5	Improbable	Fair	East B	Retain			Slightly suppressed; epicormic growth; vines.
3145	American Basswood	*Tilia americana*	Native	2	20.1	5.5	Possible	Fair	East B	Retain			Second stem under 10; asymmetrical crown due west; vines; stem lean west; suppressed.
3146	American Basswood	*Tilia americana*	Native	1	31.5	6.5	Possible	Fair	East B	Retain			Asymmetrical crown due west; vines; stem lean west; phototrophic growth.
3147	American Basswood	*Tilia americana*	Native	1	24.3	4.0	Possible	Poor	East B	Retain			Crown dieback; vines; canker.
3148	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	49.5	5.0	Possible	Dead	East B	Retain			Crown intact.
3149	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	29.0	4.0	Possible	Poor	East B	Retain			Crown intact; 5% crown remains; adjacent stem resting on crown.
3150	Willow species	*Salix sp.*	Native	1	59.8	5.0	Probable	Dead	East B	Remove	Condition	No	Broken top resting on adjacent tree.
3151	Manitoba Maple	*Acer negundo*	Native	1	31.0	5.0	Improbable	Fair	East B	Retain			Stem lean west; asymmetrical crown due west; vines.

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3152	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	23.3	4.0	Improbable	Fair	East B	Retain			Epicormic growth; asymmetrical crown due west.
3153	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	38.5	5.0	Improbable	Fair	East B	Retain			Codominant leaders, split, compartmentalized wounds; light pruning; reaction wood.
3154	American Basswood	*Tilia americana*	Native	2	37.0	8.0	Improbable	Fair	East B	Retain			Asymmetrical crown due west; canker.
3155	Manitoba Maple	*Acer negundo*	Native	1	14.0	3.0	Improbable	Fair	East B	Retain			Asymmetrical crown due west; light pruning; suckers.
3156	American Basswood	*Tilia americana*	Native	1	16.9	4.0	Improbable	Fair	East B	Retain			Asymmetrical crown due west; slightly suppressed.
3157	American Basswood	*Tilia americana*	Native	1	12.8	4.0	Improbable	Fair	East B	Retain			Asymmetrical crown due west; suppressed.
3158	American Basswood	*Tilia americana*	Native	1	36.3	4.5	Possible	Fair	East B	Retain			Asymmetrical crown due west; slightly suppressed; canker; compartmentalized wounds; some rot.
3159	American Basswood	*Tilia americana*	Native	3	88.0	8.0	Improbable	Good	East B	Retain			Asymmetrical crown due west; branch rub.
3160	American Basswood	*Tilia americana*	Native	1	16.2	3.0	Improbable	Fair	East B	Retain			Asymmetrical crown due west; stem lean west; canker.
3161	American Basswood	*Tilia americana*	Native	1	28.5	6.0	Improbable	Fair	East B	Retain			Asymmetrical crown due west; stem lean west; canker; dead stem resting in crook of branches.
3162	American Basswood	*Tilia americana*	Native	2	39.0	6.0	Improbable	Fair	East B	Retain			Asymmetrical crown due west; stem lean west; canker.
3163	American Basswood	*Tilia americana*	Native	1	17.0	6.0	Improbable	Fair	East B	Retain			Asymmetrical crown due west; stem lean west; canker.
3164	American Basswood	*Tilia americana*	Native	1	30.0	4.0	Improbable	Fair	East B	Retain			Asymmetrical crown due east; stem lean east; canker.
3165	American Basswood	*Tilia americana*	Native	1	22.3	6.0	Improbable	Fair	East B	Retain			Asymmetrical crown due west; stem lean west; canker.
3166	American Basswood	*Tilia americana*	Native	1	31.5	6.0	Improbable	Fair	East B	Retain			Asymmetrical crown due west; stem lean west; canker; reaction wood.
3167	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	36.6	6.5	Improbable	Fair	East B	Retain			Light pruning; branch rub.
3168	American Basswood	*Tilia americana*	Native	1	67.0	9.0	Improbable	Fair	East B	Retain			Main stem hallow, basal wound, compartmentalized, some rot; canker.
3169	American Basswood	*Tilia americana*	Native	2	104.0	10.0	Possible	Fair	East B	Retain			Asymmetrical crown due west; light pruning; hangers; broken branch.
3170	American Basswood	*Tilia americana*	Native	3	90.0	11.0	Possible	Fair	East B	Retain			Asymmetrical crown due west; canker; suckers; crown dieback; large wound on lower stem.
3171	Manitoba Maple	*Acer negundo*	Native	1	13.0	3.0	Improbable	Fair	East B	Retain			Stem lean north; asymmetrical crown due north; suppressed.
3172	American Basswood	*Tilia americana*	Native	2	46.0	5.0	Improbable	Fair	East B	Retain			Asymmetrical crown due east; cut wood piled at base; suckers.
3173	American Basswood	*Tilia americana*	Native	1	28.0	5.0	Improbable	Fair	East B	Retain			Asymmetrical crown due east; cut wood piled at base; suckers; reaction wood.
3174	Crack Willow	*Salix fragilis*	Non-Native	7	243.0	12.0	Improbable	Good	East A	Retain			Water sprouts; branch rub; light pruning.
3175	Crack Willow	*Salix fragilis*	Non-Native	2	54.0	10.0	Improbable	Fair	East A	Retain			Asymmetrical crown due north; stem lean north; water sprouts; branch rub.
3176	Crack Willow	*Salix fragilis*	Non-Native	13	450.0	13.0	Possible	Fair	East A	Retain			Water sprouts; branch rub; light pruning; vines.
3177	Crack Willow	*Salix fragilis*	Non-Native	2	59.0	8.5	Possible	Good	East A	Retain			Water sprouts; light pruning.
3178	Crack Willow	*Salix fragilis*	Non-Native	1	38.3	5.0	Improbable	Good	East A	Retain			Light pruning; epicormic growth; phototrophic growth.
3179	Crack Willow	*Salix fragilis*	Non-Native	3	158.0	11.0	Possible	Fair	East A	Retain			Asymmetrical crown due south; pistol butt; stem lean south; branch rub; epicormic growth; light pruning.
3180	Crack Willow	*Salix fragilis*	Non-Native	2	63.0	12.0	Improbable	Fair	East A	Retain			Asymmetrical crown due east; stem lean east; water sprouts; light pruning.
3181	Freeman's Maple	*Acer X freemanii*	Native	1	10.4	4.0	Improbable	Fair	East A	Retain			Asymmetrical crown due east; compartmentalized wounds; suckers; suppressed.
B7	Butternut	*Juglans cinerea*	Native	1	10.8	3.5	Improbable	Fair	East B	Retain			Crown suppressed by adjacent tree; no sign of canker; riverbank grape in lower scaffold branches.
fa	Black Walnut	*Juglans nigra*	Native	1	18.0	3.5	Improbable	Good	Central	Retain			No visible defects.
fb	Black Walnut	*Juglans nigra*	Native	1	83.9	7.0	Possible	Good	Central	Retain			Branch with sapwood rot; history of branch pruning; included bark; electrical cord affixed to stem.
fc	Black Walnut	*Juglans nigra*	Native	1	38.0	5.0	Improbable	Good	Central	Retain			Asymmetrical crown due south; adjacent to shed; history of branch pruning; light pruning.
fd	Black Walnut	*Juglans nigra*	Native	1	42.0	6.0	Improbable	Good	Central	Retain			Codominant leaders; wide union; adjacent to shed; history of branch pruning; light pruning.
fe	Black Walnut	*Juglans nigra*	Native	1	18.8	2.5	Improbable	Good	Central	Retain			Light pruning; phototrophic growth.
ff	Black Walnut	*Juglans nigra*	Native	1	41.5	3.5	Possible	Good	Central	Retain			Light pruning; history of branch pruning.
fg	Eastern White Pine	*Pinus strobus*	Native	1	28.5	4.5	Improbable	Good	Central	Retain			Asymmetrical crown due north; history of branch pruning; improper prune cuts; phototrophic growth.
fh	Norway Spruce	*Picea abies*	Non-Native	1	30.5	3.0	Improbable	Good	Central	Retain			Light pruning; improper prune cuts.
fi	Silver Maple	*Acer saccharinum*	Native	2	102.0	3.5	Improbable	Fair	Central	Retain			Woundwood; epicormic growth; girdling root.
fj	White Ash	*Fraxinus americana*	Native	1	10.3	1.0	Improbable	Poor	Central	Retain			Suppressed; epicormic growth.
fk	Norway Spruce	*Picea abies*	Non-Native	1	14.3	1.0	Improbable	Fair	Central	Retain			Light pruning; suppressed.
fl	Eastern White Pine	*Pinus strobus*	Native	1	37.5	3.5	Improbable	Good	Central	Retain			Light pruning; branch rub.
fm	Norway Spruce	*Picea abies*	Non-Native	1	23.0	2.0	Improbable	Fair	Central	Retain			Light pruning; exposed root crown; girdling root.
fn	Norway Spruce	*Picea abies*	Non-Native	1	15.4	1.5	Improbable	Fair	Central	Retain			Light pruning; exposed roots.
fo	Norway Spruce	*Picea abies*	Non-Native	1	14.5	2.0	Improbable	Poor	Central	Retain			Light pruning; suppressed.
fp	Norway Spruce	*Picea abies*	Non-Native	1	19.2	2.0	Improbable	Fair	Central	Retain			Light pruning; suppressed.
fq	Norway Spruce	*Picea abies*	Non-Native	1	18.5	2.0	Improbable	Poor	Central	Retain			Light pruning; suppressed.
fr	Norway Spruce	*Picea abies*	Non-Native	1	26.4	4.5	Improbable	Good	Central	Retain			Light pruning.
fs	Eastern Cottonwood	*Populus deltoides*	Native	2	82.0	6.5	Improbable	Good	Central	Retain			Included bark; asymmetrical crown due north; branch rub; light pruning.
ft	Norway Spruce	*Picea abies*	Non-Native	1	18.7	4.0	Improbable	Fair	Central	Retain			Asymmetrical crown due north; slightly suppressed.
fu	Norway Spruce	*Picea abies*	Non-Native	1	17.0	3.0	Improbable	Poor	Central	Retain			Asymmetrical crown due north; suppressed; light pruning.
fv	Norway Spruce	*Picea abies*	Non-Native	1	13.6	3.0	Improbable	Fair	Central	Retain			Asymmetrical crown due north; light pruning.
fw	Black Walnut	*Juglans nigra*	Native	1	15.9	2.0	Improbable	Fair	Central	Retain			Canker; light pruning; slightly suppressed.
fx	Norway Spruce	*Picea abies*	Non-Native	1	16.7	3.0	Improbable	Poor	Central	Retain			Suppressed; phototrophic growth.
fy	Norway Spruce	*Picea abies*	Non-Native	1	10.4	1.5	Improbable	Poor	Central	Retain			Suppressed; T-bar wrapped to stem with rubber tube.

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Location	Proposed Action	Rationale for Removal	Compensation Required	Comments
fz	Golden Weeping Willow	*Salix alba var. vitellina*	Non-Native	1	69.5	6.0	Probable	Fair	Central	Remove	Condition	Yes	Burl; history of branch failure; large hanger; phototrophic growth.
ga	Eastern White Pine	*Pinus strobus*	Native	1	14.3	2.5	Improbable	Fair	Central	Retain			Light pruning; slightly suppressed.
gb	Black Walnut	*Juglans nigra*	Native	1	15.3	3.0	Improbable	Fair	Central	Retain			Codominant leaders; included bark; asymmetrical crown due west.
gc	Black Walnut	*Juglans nigra*	Native	1	37.7	5.5	Improbable	Fair	Central	Retain			Asymmetrical crown due west; light pruning; phototrophic growth; branch rub.
gd	Norway Spruce	*Picea abies*	Non-Native	1	16.9	2.0	Improbable	Fair	Central	Retain			Suppressed.
ge	Norway Spruce	*Picea abies*	Non-Native	1	17.6	2.0	Improbable	Fair	Central	Retain			Suppressed; light pruning.
gf	Black Walnut	*Juglans nigra*	Native	1	22.6	4.5	Improbable	Good	Central	Retain			Asymmetrical crown due west; light pruning.
gg	Norway Spruce	*Picea abies*	Non-Native	1	14.3	2.0	Improbable	Fair	Central	Retain			Light pruning; slightly suppressed.
gh	Norway Spruce	*Picea abies*	Non-Native	1	19.9	2.0	Improbable	Fair	Central	Retain			Light pruning; slightly suppressed.
gi	Eastern White Pine	*Pinus strobus*	Native	1	17.0	1.5	Improbable	Fair	Central	Retain			Codominant leaders, wide union; slightly suppressed.
gj	Black Walnut	*Juglans nigra*	Native	1	11.8	1.5	Improbable	Fair	Central	Retain			Suppressed; light pruning; canker.
gk	Black Walnut	*Juglans nigra*	Native	1	39.9	5.0	Improbable	Fair	Central	Retain			Asymmetrical crown due west; light pruning; canker; codominant leaders; included bark.
gl	Black Walnut	*Juglans nigra*	Native	1	27.8	5.0	Improbable	Fair	Central	Retain			Asymmetrical crown due west; vines; slightly suppressed.
gm	Black Walnut	*Juglans nigra*	Native	1	19.2	3.0	Improbable	Fair	Central	Retain			Asymmetrical crown due west; included bark; slightly suppressed.
gn	Black Walnut	*Juglans nigra*	Native	1	27.5	4.0	Improbable	Fair	Central	Retain			Canker; asymmetrical crown due west; light pruning.
go	Black Walnut	*Juglans nigra*	Native	1	26.1	4.0	Improbable	Fair	Central	Retain			Asymmetrical crown due west; light pruning; vines.
gp	Black Walnut	*Juglans nigra*	Native	1	27.1	4.5	Improbable	Fair	Central	Retain			Asymmetrical crown due west; light pruning; vines.
gq	Black Walnut	*Juglans nigra*	Native	1	29.6	5.0	Improbable	Fair	Central	Retain			Decent structure; slightly crooked stem; some epicormic growth.
gr	Black Walnut	*Juglans nigra*	Native	1	25.4	4.0	Improbable	Good	Central	Retain			Dead lower branches; tall tree, high crown.
gs	White Spruce	*Picea glauca*	Native	1	27.3	3.0	Improbable	Good	Central	Retain			Good structure; exuding sap.
gt	Eastern White Pine	*Pinus strobus*	Native	1	36.0	4.5	Improbable	Good	Central	Retain			No visible defects.
gu	White Spruce	*Picea glauca*	Native	1	31.0	3.0	Improbable	Good	Central	Retain			Slightly suppressed.
gv	White Spruce	*Picea glauca*	Native	1	20.8	2.5	Improbable	Fair	Central	Retain			Slightly suppressed; minor thinning.
gw	White Spruce	*Picea glauca*	Native	1	17.0	2.0	Improbable	Fair	Central	Retain			Suppressed crown; stem crossing adjacent tree.
gx	Silver Maple	*Acer saccharinum*	Native	2	57.0	7.0	Improbable	Fair	Central	Retain			Included bark between subordinate stem; branch rubbing wound; minor dieback.
gy	White Ash	*Fraxinus americana*	Native	1	13.2	2.0	Possible	Poor	Central	Retain			Dead top, live epicormic growth.
gz	Norway Spruce	*Picea abies*	Non-Native	1	13.1	2.0	Improbable	Fair	Central	Retain			Suppressed crown.
ha	Norway Spruce	*Picea abies*	Non-Native	1	19.8	3.0	Improbable	Fair	Central	Retain			Crooked stem; roots exposed.
hb	Black Walnut	*Juglans nigra*	Native	1	18.1	4.5	Possible	Fair	Central	Retain			Poor branch structure; epicormic growth; crossing branches.
hc	White Ash	*Fraxinus americana*	Native	2	37.0	4.0	Probable	Poor	Central	Remove	Condition	Yes	Codominant stems with dead tops; sapwood decay; shedding bark; live epicormic growth.
hd	White Spruce	*Picea glauca*	Native	1	22.0	2.5	Improbable	Fair	Central	Retain			Suppressed crown, thinning.
he	White Spruce	*Picea glauca*	Native	1	12.7	1.5	Improbable	Fair	Central	Retain			Suppressed crown, thinning.
hf	Norway Spruce	*Picea abies*	Non-Native	1	24.9	3.5	Improbable	Fair	Central	Retain			Minor crown thinning.
hg	Norway Spruce	*Picea abies*	Non-Native	1	24.5	3.5	Improbable	Good	Central	Retain			No defects visible; growing under large Cottonwood.
hh	Eastern Cottonwood	*Populus deltoides*	Native	1	86.9	6.5	Improbable	Good	Central	Retain			Large codominant stems with included bark, staining; 5% live crown lost; 2 past failures.
hi	Norway Spruce	*Picea abies*	Non-Native	1	11.3	1.5	Improbable	Fair	Central	Retain			Suppressed crown.
hj	Black Walnut	*Juglans nigra*	Native	1	12.1	3.0	Improbable	Fair	Central	Retain			Asymmetrical crown due to neighboring trees; strong taper.
hk	Golden Weeping Willow	*Salix alba var. vitellina*	Non-Native	1	58.0	7.0	Possible	Fair	Central	Retain			Crooked stem, twisting form; history of branch failures; water sprouts; cankers in branches.
hl	Golden Weeping Willow	*Salix alba var. vitellina*	Non-Native	1	113.4	8.0	Possible	Fair	Central	Retain			Included bark between massive codominant leaders; metal stake emerging from stem; history of branch failure; some crown thinning.
hm	Black Walnut	*Juglans nigra*	Native	1	39.1	6.5	Improbable	Good	Central	Retain			Canker wounds closed; epicormic growth.
hn	Black Walnut	*Juglans nigra*	Native	1	28.0	4.0	Possible	Fair	Central	Retain			Closed canker wounds; codominant leaders; minor foliar necrosis.
ho	Black Walnut	*Juglans nigra*	Native	1	26.9	4.0	Improbable	Good	Central	Retain			Closed canker wounds.
hp	Silver Maple	*Acer saccharinum*	Native	1	37.5	4.5	Possible	Poor	Central	Retain			Codominant stems with closed small wounds; 25% live crown lost.
hq	Norway Spruce	*Picea abies*	Non-Native	1	19.1	2.0	Possible	Poor	Central	Retain			Strong taper, dead leader; suppressed crown.
hr	Black Walnut	*Juglans nigra*	Native	1	30.8	5.0	Improbable	Fair	Central	Retain			Closed canker wounds; epicormic growth.
hs	Black Walnut	*Juglans nigra*	Native	1	33.4	4.5	Improbable	Fair	Central	Retain			Closed canker wounds; few dead branches; tight branch angle.
ht	Black Walnut	*Juglans nigra*	Native	1	45.4	6.0	Improbable	Good	Central	Retain			Closed canker wounds; codominant leaders; epicormic growth.
hu	Eastern White Pine	*Pinus strobus*	Native	1	17.5	2.5	Possible	Poor	Central	Retain			Crooked stem; suppressed, asymmetrical crown.
hv	Black Walnut	*Juglans nigra*	Native	1	33.2	6.0	Improbable	Good	Central	Retain			Codominant leaders; light pruning.
hw	Hawthorn species	*Crataegus sp.*	Native	3	33.0	3.0	Improbable	Fair	Central	Retain			Many-stemmed, densely branched; draped in grapevine; suppressed crown.
hx	Hawthorn species	*Crataegus sp.*	Native	3	23.0	3.0	Improbable	Fair	Central	Retain			Multi-stemmed; arching crown, densely branched.
hy	Hawthorn species	*Crataegus sp.*	Native	2	27.0	5.0	Improbable	Fair	Central	Retain			Asymmetrical crown due west; branch rub; broken branches.
hz	Black Walnut	*Juglans nigra*	Native	2	80.0	6.0	Improbable	Good	Central	Remove	Street E	Yes	Leaf spotting; light pruning; included bark; branch rub.
ia	Hawthorn species	*Crataegus sp.*	Native	4	87.0	6.0	Improbable	Fair	Central	Retain			Asymmetrical crown due east; cavity, some rot; branch rub; broken branches.
ib	Black Walnut	*Juglans nigra*	Native	1	39.2	6.0	Improbable	Fair	Central	Retain			Asymmetrical crown due west; canker; burl; light pruning.
ic	Hawthorn species	*Crataegus sp.*	Native	1	40.2	6.0	Possible	Fair	Central	Retain			Asymmetrical crown due west; branch rub; cavities with rot; small hangers.
id	Norway Spruce	*Picea abies*	Non-Native	1	38.0	2.0	Improbable	Good	Central	Retain			Light pruning; vines.
ie	Hawthorn species	*Crataegus sp.*	Native	5	10.5	3.5	Improbable	Fair	Central	Retain			Minor dieback; multi stem with most <10cm; minor rust.
if	Sweet Cherry	*Prunus avium*	Non-Native	1	31.0	4.0	Improbable	Good	Central	Retain			Minor dieback; compartmentalized stem seam; minor sapsucker damage.
ig	Black Walnut	*Juglans nigra*	Native	1	39.2	6.5	Improbable	Fair	Central	Retain			Some crown dieback; minor canker; included bark between branch unions.
ih	Shagbark Hickory	*Carya ovata var. ovata*	Native	1	26.5	3.0	Improbable	Good	Central	Retain			Vigorous crown; slightly asymmetrical crown due to neighbouring tree; wound wood over old prune cuts; leaf miners.

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Location	Proposed Action	Rationale for Removal	Compensation Required	Comments
ii	Hawthorn species	*Crataegus sp.*	Native	3	33.0	2.5	Possible	Fair	Central	Retain			Epicormic growth; branch rub; dieback.
ij	Black Cherry	*Prunus serotina*	Native	2	91.0	8.0	Possible	Fair	Central	Retain			Smaller stem major dieback, large compartmentalized wound along upper stem; included bark; light pruning; asymmetrical crown due west.
ik	Hawthorn species	*Crataegus sp.*	Native	1	10.0	4.0	Improbable	Fair	Central	Retain			No visible defects; inaccessible.
il	Austrian Pine	*Pinus nigra*	Non-Native	1	34.7	4.0	Improbable	Fair	Central	Retain			Light pruning; included bark; improper prune cuts.
im	Austrian Pine	*Pinus nigra*	Non-Native	1	20.9	3.0	Improbable	Fair	Central	Retain			Light pruning.
in	Austrian Pine	*Pinus nigra*	Non-Native	1	23.5	3.0	Improbable	Fair	Central	Retain			Light pruning; sapsucker holes; codominant leaders; included bark.
io	Austrian Pine	*Pinus nigra*	Non-Native	1	24.8	3.0	Improbable	Fair	Central	Retain			Light pruning; sapsucker holes.
ip	Austrian Pine	*Pinus nigra*	Non-Native	1	18.0	3.0	Improbable	Fair	Central	Retain			Light pruning.
iq	Norway Maple	*Acer platanoides*	Non-Native	1	15.6	3.0	Improbable	Fair	Central	Retain			Tar spots; branch rub; included bark; mower damage; slight stem lean east.
ir	Northern Catalpa	*Catalpa speciosa*	Non-Native	2	65.0	6.5	Improbable	Fair	Central	Retain			Basal cavity, some rot; included bark; epicormic growth; light pruning; branch rub; mower damage.
is	Norway Spruce	*Picea abies*	Non-Native	2	73.0	5.0	Improbable	Good	Central	Retain			Codominant stems; branch rubbing wounds.
it	Norway Spruce	*Picea abies*	Non-Native	1	35.0	4.0	Improbable	Good	Central	Retain			Light pruning.
iu	Hawthorn species	*Crataegus sp.*	Native	2	11.4	3.0	Possible	Poor	Central	Retain			Poor form; leaning east; branch failures; suppressed crown.
iv	Hawthorn species	*Crataegus sp.*	Native	1	12.1	2.5	Improbable	Fair	Central	Retain			Crossing branches; phototrophic growth.
iw	Austrian Pine	*Pinus nigra*	Non-Native	1	28.3	3.0	Improbable	Fair	Central	Retain			Lower crown thinning; codominant leaders.
ix	Austrian Pine	*Pinus nigra*	Non-Native	1	20.7	2.5	Improbable	Good	Central	Retain			Healthy crown.
iy	Norway Maple	*Acer platanoides*	Non-Native	1	13.1	2.0	Improbable	Good	Central	Retain			Dense, low crown; minor insect defoliation.
iz	Northern Catalpa	*Catalpa speciosa*	Non-Native	2	73.0	4.5	Improbable	Good	Central	Retain			Included bark between primary and secondary stems; light pruning; lawnmower damage to exposed roots; torsional bark seams.
JUG-120	Butternut	*Juglans cinerea*	Native	1	12.8	3.5	Improbable	Fair	Central	Retain			Asymmetrical crown due north; slightly suppressed; light pruning; sooty spot on branch.
JUG-121	Butternut	*Juglans cinerea*	Native	2	21.0	4.0	Improbable	Fair	Central	Retain			Asymmetrical crown due west; open sore near base; open canker near base; leaf spotting; included bark.
JUG-122	Butternut	*Juglans cinerea*	Native	1	16.1	3.0	Improbable	Good	Central	Retain			Full, vigorous crown, no evidence of canker; solid main stem.
JUG-137	Butternut	*Juglans cinerea*	Native	1	34.4	0.5	Possible	Dead	Central	Retain			Crown snapped off; extensive canker.
JUG-138	Butternut	*Juglans cinerea*	Native	1	39.0	0.5	Probable	Dead	Central	Retain			Almost completely enveloped in riverbank grape; debris piled up close to main stem.
JUG-140	Butternut	*Juglans cinerea*	Native	1	17.7	5.0	Possible	Fair	Central	Retain			On verge of poor; one sided crown with dieback; exposed roots due to fluctuating water level.

Appendix II

Tree Assessment Criteria

Tree Risk 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 a risk assessor to encounter, and it may require immediate action to protect people from harm.
*A specified time frame of 2 years will be used when assessing potential for structural failure.	

[1]Dunster et al. 2013

Appendix III

Conditions of Tree Assessment

Conditions of Tree Assessment

Limitations

This tree inventory and assessment is based on the circumstances and observations by Natural Resource Solutions Inc. (NRSI) as they existed at the time of the site inspection(s) of the subject sites as described in this report (the “Property”) and the trees situated thereon, and upon information provided by the Client to NRSI. The opinions in this assessment are based on observations made and using professional judgment, however, because trees are living organisms and subject to change, damage and disease, the analysis and recommendations as set out in this assessment are valid for 2 years from the date any such observations and assessment took place. As a result, the Client shall not rely upon this assessment, save and except for representing the circumstances and observations at the date of site inspection(s), and the analysis and recommendations made in relation to the proposed undertaking. It is recommended that the inventoried trees discussed in this assessment should be re-assessed periodically, where required (i.e. after 2 years).

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 including, without limitation, acting 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 providing payment of the Assessor’s regular hourly billing fees.

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

Assumptions

The Client is hereby notified that where any of the information set out and referenced in this assessment are based on assumptions, facts or information provided to NRSI, NRSI

will in no way be responsible for the veracity or accuracy of any such information. Further, the Client acknowledges and agrees that NRSI has, for the purposes of preparing their assessment, assumed that the Property 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.

Restriction of Assessment

The assessment carried out was restricted to the Property as described in this report. No assessment of any other trees has been undertaken by NRSI, save those within approximately 3m of the subject sites. NRSI is not legally liable for any other trees 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. 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.

No guarantees are offered, or implied, that trees recommended for retention, 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 extreme 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 with 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 for the Client. The data collected reflect NRSI's best assessment of the inventoried trees situated on the Property with the information available at the time of observation. Data analysis and the assessment of potential impacts to inventoried trees is specific to the proposed undertaking as described in this report. 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 of this assessment for purposes unrelated to the proposed undertaking.

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	Good	Fair	Poor	Dead	Total
Native Species						
American Basswood	*Tilia americana*	7	52	15	2	76
American Beech	*Fagus grandifolia*	3	5	2		10
Balsam Poplar	*Populus balsamifera*	1	4	1		6
Bebb Willow	*Salix bebbiana*			1		1
Bitternut Hickory	*Carya cordiformis*	1		1		2
Black Cherry	*Prunus serotina*	2	32	10	1	45
Black Spruce	*Picea mariana*	1				1
Black Walnut	*Juglans nigra*	158	189	16		363
Black Willow	*Salix nigra*	2	5	2	1	10
Bur Oak	*Quercus macrocarpa*	2	1	3		6
Butternut	*Juglans cinerea*	1	4		2	7
Eastern Cottonwood	*Populus deltoides*	4				4
Eastern Red Cedar	*Juniperus virginiana*		1			1
Eastern White Pine	*Pinus strobus*	5	2	1		8
Freeman's Maple	*Acer* X *freemanii*		3			3
Hawthorn species	*Crataegus* sp.	16	115	48	2	181
Honey Locust	*Gleditsia triacanthos*	6	22	1		29
Hop Hornbeam	*Ostrya virginiana*		5	1		6
Manitoba Maple	*Acer negundo*	6	61	11	1	79
Peachleaf Willow	*Salix amygdaloides*	1				1
Red Oak	*Quercus rubra*	24	13			37
Shagbark Hickory	*Carya ovata* var. *ovata*	24	5			29
Silver Maple	*Acer saccharinum*	7	5	1		13
Slippery Elm	*Ulmus rubra*		1			1
Staghorn Sumac	*Rhus typhina*	1	2	2		5
Sugar Maple	*Acer saccharum* ssp. *saccharum*	44	42	12	3	101
Swamp Serviceberry	*Amelanchier canadensis*	1				1
White Ash	*Fraxinus americana*	5	9	4		18
White Elm	*Ulmus americana*	1	6			7
White Oak	*Quercus alba*	2		1		3
White Spruce	*Picea glauca*	10	11	5		26
Willow species	*Salix* sp.				1	1
Total		**335**	**595**	**138**	**13**	**1,081**
Non-Native Species						
Austrian Pine	*Pinus nigra*	1	6			7
Black Locust	*Robinia pseudoacacia*	3	14			17
Common Apple	*Malus domestica*	2	21	24	1	48
Common Pear	*Pyrus communis*			2		2
Common Plum	*Prunus domestica*		1			1

Common Name	Scientific Name	Good	Fair	Poor	Dead	Total
Crack Willow	*Salix fragilis*	4	15	1		20
Golden Weeping Willow	*Salix alba* var. *vitellina*	1	10			11
Horsechestnut	*Aesculus hippocastanum*		4	3	1	8
Northern Catalpa	*Catalpa speciosa*	1	1			2
Norway Maple	*Acer platanoides*	2	4			6
Norway Spruce	*Picea abies*	7	14	6		27
Small Leaf Linden	*Tilia cordata*		1			1
Sweet Cherry	*Prunus avium*	13	21	5	1	40
Tree-of-Heaven	*Ailanthus altissima*	1				1
White Mulberry	*Morus alba*		1			1
White Willow	*Salix alba*	1	1			2
Total		**36**	**114**	**41**	**3**	**194**
Unknown						
Unknown species					**3**	**3**
Overall Total		**371**	**709**	**179**	**19**	**1,278**

Overall Health of Trees Inventoried

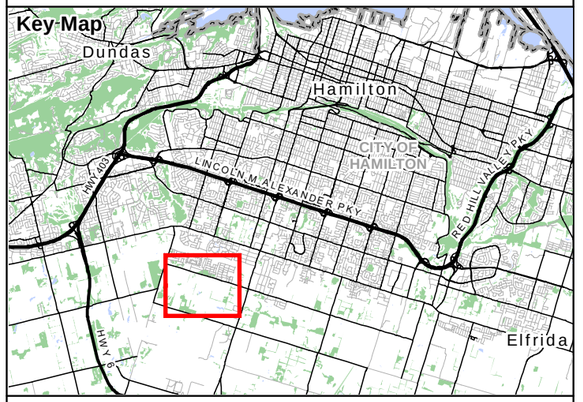
Potential for Structural Failure Rating	Overall Condition				Total
	Good	Fair	Poor	Dead	
Improbable	354	496	24	--	874
Possible	16	208	139	9	372
Probable	1	5	16	10	32
Imminent	--	--	--	--	0
Total	**371**	**709**	**179**	**19**	**1,278**

Maps

Map 1

Upper West Side Urban Boundary Expansion, Central and East Blocks

Study Area



Legend

- Subject Site
- Study Area
- Provincially Significant Wetland (PSW)
- Woodlot
- Significant Woodlands (Aquafor Beech 2017)
- Permanent Watercourse
- Intermittent Watercourse
- Water Body

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1974E
Date: November 25, 2019

NAD83 - UTM Zone 17
Size: 11x17"
1:8,000

0 100 200 300 400 500 Metres

N

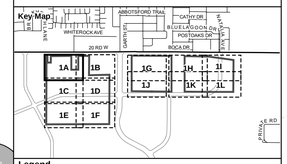
Path: X:\1405_TwentyRdLandownersGroupAssessments\NRSI_1974E_Map1_UBE_CE_StudyArea_8K_2019_11_25_KEF.mxd

Map 2A

Upper West Side Urban Boundary Expansion

Tree Inventory

Key Map



Legend

- Subject Sites
- Proposed Development
- Existing Conditions
- Existing Contour
- Utility Line
- Primary Road
- Secondary Road
- Permanent Watercourse
- Intermittent Watercourse

NRSI 2019 Inventory

- Inventoried Tree to be Retained (Crown to Scale)
- Inventoried Tree to be Removed (Crown to Scale)
- Potential Bat Roost Tree
- Butternut (Health Assessment Completed)
- Butternut (To Be Assessed)
- Cedar Hedgerow
- Dripline

NRSI 2018 Inventory

- Inventoried Tree to be Retained (Crown to Scale)
- Inventoried Tree to be Removed (Crown to Scale)

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Project: 19748
Date: February 27, 2020

NAD83 - UTM Zone 17
Size: 24x36"
1:400

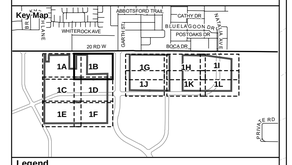
0 10 20 30 Meters

Map 2B

Upper West Side Urban Boundary Expansion

Tree Inventory

Key Map



Legend

- Subject Sites
- Proposed Development
- Existing Conditions
- Existing Contour
- Utility Line
- Primary Road
- Secondary Road
- Permanent Watercourse
- Intermittent Watercourse

NRSI 2019 Inventory

- Inventoried Tree to be Retained (Crown to Scale)
- Inventoried Tree to be Removed (Crown to Scale)
- Potential Bat Roost Tree
- Butternut (Health Assessment Completed)
- Butternut (To Be Assessed)
- Cedar Hedgerow
- Dripline

NRSI 2018 Inventory

- Inventoried Tree to be Retained (Crown to Scale)
- Inventoried Tree to be Removed (Crown to Scale)

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Project: 19748
Date: February 27, 2020

NAD83 - UTM Zone 17
Size: 24x36"
1:400

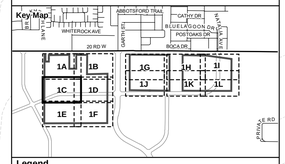
0 10 20 30 Meters

Map 2C

Upper West Side Urban Boundary Expansion

Tree Inventory

Key Map



Legend

- Subject Sites
- Proposed Development
- Existing Conditions
- Existing Contour
- Utility Line
- Primary Road
- Secondary Road
- Permanent Watercourse
- Intermittent Watercourse

NRSI 2019 Inventory

- Inventoried Tree to be Retained (Crown to Scale)
- Inventoried Tree to be Removed (Crown to Scale)
- Potential Bat Roost Tree
- Butternut (Health Assessment Completed)
- Butternut (To Be Assessed)
- Cedar Hedgerow
- Dripline

NRSI 2018 Inventory

- Inventoried Tree to be Retained (Crown to Scale)
- Inventoried Tree to be Removed (Crown to Scale)

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Project: 19748
Date: February 27, 2020

NAD83 - UTM Zone 17
Size: 24x36"
1:400

0 10 20 30 Meters

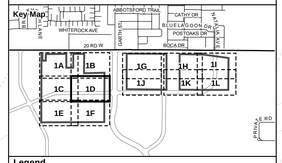
STREET B

Map 2D

Upper West Side Urban Boundary Expansion

Tree Inventory

Key Map



Legend

- Subject Sites
- Proposed Development
- Existing Conditions
- Existing Contour
- Utility Line
- Primary Road
- Secondary Road
- Permanent Watercourse
- Intermittent Watercourse

NRSI 2019 Inventory

- Inventoried Tree to be Retained (Crown to Scale)
- Inventoried Tree to be Removed (Crown to Scale)
- Potential Bat Roost Tree
- Butternut (Health Assessment Completed)
- Butternut (To Be Assessed)
- Cedar Hedgerow
- Dripline

NRSI 2018 Inventory

- Inventoried Tree to be Retained (Crown to Scale)
- Inventoried Tree to be Removed (Crown to Scale)

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Project: 19748
Date: February 27, 2020

NAD83 - UTM Zone 17
Size: 24x36"
1:400

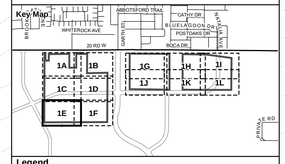
0 10 20 30 Meters

Map 2E

Upper West Side Urban Boundary Expansion

Tree Inventory

Key Map



Legend

- Subject Sites
- Proposed Development
- Existing Conditions
- Existing Contour
- Utility Line
- Primary Road
- Secondary Road
- Permanent Watercourse
- Intermittent Watercourse

NRSI 2019 Inventory

- Inventoried Tree to be Retained (Crown to Scale)
- Inventoried Tree to be Removed (Crown to Scale)
- Potential Bat Roost Tree
- Butternut (Health Assessment Completed)
- Butternut (To Be Assessed)
- Cedar Hedgerow
- Dripline

NRSI 2018 Inventory

- Inventoried Tree to be Retained (Crown to Scale)
- Inventoried Tree to be Removed (Crown to Scale)

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 19748
Date: February 27, 2020

NAD83 - UTM Zone 17
Size: 24x36"
1:400

0 10 20 30 Meters

JUG-120

JUG-028

JUG-027

JUG-140

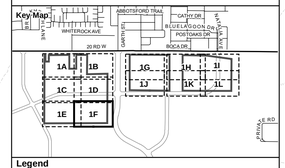
JUG-139

Map 2F

Upper West Side Urban Boundary Expansion

Tree Inventory

Key Map



Legend

- Subject Sites
- Proposed Development
- Existing Conditions
- Existing Contour
- Utility Line
- Primary Road
- Secondary Road
- Permanent Watercourse
- Intermittent Watercourse

NRSI 2019 Inventory

- Inventoried Tree to be Retained (Crown to Scale)
- Inventoried Tree to be Removed (Crown to Scale)
- Potential Bat Roost Tree
- Butternut (Health Assessment Completed)
- Butternut (To Be Assessed)
- Cedar Hedgerow
- Dripline

NRSI 2018 Inventory

- Inventoried Tree to be Retained (Crown to Scale)
- Inventoried Tree to be Removed (Crown to Scale)

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Project: 19748
Date: February 27, 2020

NAD83 - UTM Zone 17
Size: 24x36"
1:400

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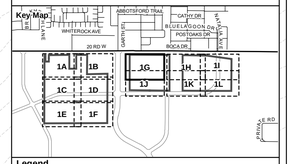
JUG-027
JUG-028
JUG-119
JUG-120

Map 2G

Upper West Side Urban Boundary Expansion

Tree Inventory

Key Map



Legend

- Subject Sites
- Proposed Development
- Existing Conditions
- Existing Contour
- Utility Line
- Primary Road
- Secondary Road
- Permanent Watercourse
- Intermittent Watercourse

NRSI 2019 Inventory

- Inventoried Tree to be Retained (Crown to Scale)
- Inventoried Tree to be Removed (Crown to Scale)
- Potential Bat Roost Tree
- Butternut (Health Assessment Completed)
- Butternut (To Be Assessed)
- Cedar Hedgerow
- Dripline

NRSI 2018 Inventory

- Inventoried Tree to be Retained (Crown to Scale)
- Inventoried Tree to be Removed (Crown to Scale)

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Aquatic, Terrestrial and Wetland Biologists

Project: 19748
Date: February 27, 2020

NAD83 - UTM Zone 17
Size: 24x36"
1:400

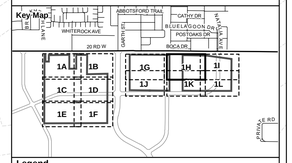
0 10 20 30 Meters

Map 2H

Upper West Side Urban Boundary Expansion

Tree Inventory

Key Map



Legend

- Subject Sites
- Proposed Development
- Existing Conditions
- Existing Contour
- Utility Line
- Primary Road
- Secondary Road
- Permanent Watercourse
- Intermittent Watercourse

NRSI 2019 Inventory

- Inventoried Tree to be Retained (Crown to Scale)
- Inventoried Tree to be Removed (Crown to Scale)
- Potential Bat Roost Tree
- Butternut (Health Assessment Completed)
- Butternut (To Be Assessed)
- Cedar Hedgerow
- Dripline

NRSI 2018 Inventory

- Inventoried Tree to be Retained (Crown to Scale)
- Inventoried Tree to be Removed (Crown to Scale)

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Project: 19748
Date: February 27, 2020

NAD83 - UTM Zone 17
Size: 24x36"
1:400

0 10 20 30 Meters

STREET B

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2
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Map 2I

Upper West Side Urban Boundary Expansion

Tree Inventory

Key Map

Legend

- Subject Sites
- Proposed Development
- Existing Conditions
- Existing Contour
- Utility Line
- Primary Road
- Secondary Road
- Permanent Watercourse
- Intermittent Watercourse

NRSI 2019 Inventory

- Inventoried Tree to be Retained (Crown to Scale)
- Inventoried Tree to be Removed (Crown to Scale)
- Potential Bat Roost Tree
- Butternut (Health Assessment Completed)
- Butternut (To Be Assessed)
- Cedar Hedgerow
- Dripline

NRSI 2018 Inventory

- Inventoried Tree to be Retained (Crown to Scale)
- Inventoried Tree to be Removed (Crown to Scale)

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Project: 19748
Date: February 27, 2020

NAD83 - UTM Zone 17
Size: 24x36"
1:400

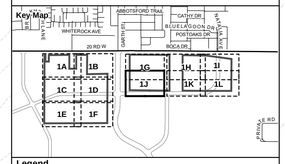
0 10 20 30 Meters

Map 2J

Upper West Side Urban Boundary Expansion

Tree Inventory

Key Map



Legend

- Subject Sites
- Proposed Development
- Existing Conditions
- Existing Contour
- Utility Line
- Primary Road
- Secondary Road
- Permanent Watercourse
- Intermittent Watercourse

NRSI 2019 Inventory

- Inventoried Tree to be Retained (Crown to Scale)
- Inventoried Tree to be Removed (Crown to Scale)
- Potential Bat Roost Tree
- Butternut (Health Assessment Completed)
- Butternut (To Be Assessed)
- Cedar Hedgerow
- Dripline

NRSI 2018 Inventory

- Inventoried Tree to be Retained (Crown to Scale)
- Inventoried Tree to be Removed (Crown to Scale)

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Project: 19748
Date: February 27, 2020

NAD83 - UTM Zone 17
Size: 24x36"
1:400

0 10 20 30 Meters

STREET B

B4

B5

JUG-083

Map 2K
Upper West Side Urban Boundary Expansion
Tree Inventory
Key Map
ABBOTSFORD TRAIL
CATHY DR
BLUELAGOON DR
POSTOAKS DR
NATALIA AVE
WHITEROCK AVE
GARTH ST
20 RD W
BOCA DR
1A
1B
1C
1D
1E
1F
1G
1H
1I
1J
1K
1L
PRIVATE RD
Legend
Subject Sites
Proposed Development
Existing Conditions
Existing Contour
Utility Line
Primary Road
Secondary Road
Permanent Watercourse
Intermittent Watercourse
NRSI 2019 Inventory
Inventoried Tree to be Retained (Crown to Scale)
Inventoried Tree to be Removed (Crown to Scale)
Potential Bat Roost Tree
Butternut (Health Assessment Completed)
Butternut (To Be Assessed)
Cedar Hedgerow
Dripline
NRSI 2018 Inventory
Inventoried Tree to be Retained (Crown to Scale)
Inventoried Tree to be Removed (Crown to Scale)
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Project: 1974B
Date: February 27, 2020
NAD83 - UTM Zone 17
Size: 24x36"
1:400
0
10
20
30
Meters
2127
2125
2126
2124
2123
2122
2119
2116
2120
2121
2117
2118
2115
2114
2113
2112
2111
2110
2109
2108
2107
2106
2104
2105
2103
2102
2099
2098
2100
2097
2101
2164
2165
2166
2168
2167
2169
2170
2172
2171
401
2054
2052
2051
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2049
2047
2046
2048
2044
2045
2042
2043
2041
2038
2039
2040
2037
2036
2035

Map 2L
Upper West Side Urban Boundary Expansion
Tree Inventory
Key Map
ABBOTSFORD TRAIL
CATHY DR
BLUELAGOON DR
POSTOAKS DR
WHITEROCK AVE
GARTH ST
NATALIA AVE
20 RD W
BOCA DR
1A
1B
1C
1D
1E
1F
1G
1H
1I
1J
1K
1L
Legend
Subject Sites
Proposed Development
Existing Conditions
Existing Contour
Utility Line
Primary Road
Secondary Road
Permanent Watercourse
Intermittent Watercourse
NRSI 2019 Inventory
Inventoried Tree to be Retained (Crown to Scale)
Inventoried Tree to be Removed (Crown to Scale)
Potential Bat Roost Tree
Butternut (Health Assessment Completed)
Butternut (To Be Assessed)
Cedar Hedgerow
Dripline
NRSI 2018 Inventory
Inventoried Tree to be Retained (Crown to Scale)
Inventoried Tree to be Removed (Crown to Scale)
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Project: 1974B
Date: February 27, 2020
NAD83 - UTM Zone 17
Size: 24x36"
1:400
N
0
10
20
30
Meters
JUG-130

Appendix V
Vascular Flora Reported from the Study Area

Plant Species Reported from the Study Area - Upper West Side Urban Boundary Expansion (Project #1974E)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Hamilton	NHIC Data*	NRSI Observed	NRSI Tree Inventory Data	RES	MAM2-2	Orchard	CUM1	HD	CUT1-4
		MNRF 2020a	MNRF 2020a	Government of Canada 2019	Government of Canada 2019	Government of Canada 2019	Oldham 2017	MNRF 2019b	*Data from 2018 - 2020*							
Pteridophytes	**Ferns & Allies**															
Dryopteridaceae	**Wood Fern Family**															
Dryopteris carthusiana	Spinulose Wood Fern	S5							x				x		X	
Onoclea sensibilis	Sensitive Fern	S5							X			X	X		X	
Equisetaceae	**Horsetail Family**															
Equisetum arvense	Field Horsetail	S5							X		X	X		X	X	X
Equisetum pratense	Meadow Horsetail	S5							X						X	
Gymnosperms	**Conifers**															
Cupressaceae	**Cypress Family**															
Juniperus virginiana	Eastern Red Cedar	S5							X	X						
Pinaceae	**Pine Family**															
Picea abies	Norway Spruce	SE3							X	X						
Picea glauca	White Spruce	S5							X	X						
Picea mariana	Black Spruce	S5							X	X						
Pinus nigra	Black Pine	SE3							X	X						
Pinus strobus	Eastern White Pine	S5							X	X	X					
Dicotyledons	**Dicots**															
Aceraceae	**Maple Family**															
Acer negundo	Manitoba Maple	S5							X	X	X		X	X	X	
Acer platanoides	Norway Maple	SE5							X	X	X					
Acer saccharinum	Silver Maple	S5							X	X						
Acer saccharum	Sugar Maple	S5							X							
Acer x freemanii	*(Acer rubrum X Acer saccharinum)*	SNA							X	X					X	
Anacardiaceae	**Sumac or Cashew Family**															
Rhus typhina	Staghorn Sumac	S5							X	X	X		X	X	X	
Toxicodendron radicans	Poison Ivy	S5							X				X		X	
Apiaceae	**Carrot or Parsley Family**															
Daucus carota	Wild Carrot	SE5							X		X		X	X		
Asclepiadaceae	**Milkweed Family**															
Asclepias syriaca	Common Milkweed	S5							X				X	X	X	X
Asteraceae	**Composite or Aster Family**															
Achillea millefolium	Common Yarrow	SE5?							X							X
Ambrosia artemisiifolia	Common Ragweed	S5							X		X					
Ambrosia trifida	Great Ragweed	S5							X		X	X	X		X	
Arctium lappa	Great Burdock	SE5							X		X					
Arctium minus	Common Burdock	SE5							X		X		X		X	
Centaurea stoebe ssp. micranthos	Spotted Knapweed	SE5							X				X			
Cichorium intybus	Chicory	SE5							X		X	X	X			
Cirsium arvense	Creeping Thistle	SE5							X		X	X	X		X	
Cirsium vulgare	Bull Thistle	SE5							X		X	X				
Erigeron annuus	Annual Fleabane	S5							X				X			X
Erigeron canadensis	Canada Horseweed	S5							X		X					
Erigeron hyssopifolius	Daisy Fleabane	S5							X		X			X		
Erigeron philadelphicus var. philadelphicu	Philadelphia Fleabane	S5					C		X						X	
Euthamia graminifolia	Grass-leaved Goldenrod	S5							X		X		X		X	
Eutrochium maculatum	Spotted Joe Pye Weed	S5					C		X			X				
Inula helenium	Elecampane	SE5							X					X		
Leucanthemum vulgare	Oxeye Daisy	SE5							X		X			X	X	
Pilosella caespitosa	Meadow Hawkweed	SE5							X					X		X
Rudbeckia triloba	Brown-eyed Susan	SE4							X				X			
Solidago canadensis	Canada Goldenrod	S5							X		X		X	X	X	
Solidago nemoralis ssp. nemoralis	Gray-stemmed Goldenrod	S5					C		X							X
Sonchus asper	Prickly Sow-thistle	SE5							X					X		
Symphyotrichum lanceolatum	Panicled Aster	S5							X		X	X	X		X	
Symphyotrichum novae-angliae	New England Aster	S5							X		X		X	X		X
Symphyotrichum puniceum var. puniceum	Swamp Aster	S5							X			X		X	X	
Symphyotrichum urophyllum	Arrow-leaved Aster	S4							X				X			X
Tanacetum vulgare	Common Tansy	SE5							X		X					
Taraxacum officinale	Common Dandelion	SE5							X		X		X		X	
Tussilago farfara	Colt's-foot	SE5							X		X					
Balsaminaceae	**Touch-me-not Family**															
Impatiens capensis	Spotted Jewelweed	S5							X		X	X	X		X	
Berberidaceae	**Barberry Family**															
Podophyllum peltatum	May-apple	S5							X						X	
Betulaceae	**Birch Family**															
Carpinus caroliniana ssp. virginiana	Blue-beech	S5							X						X	
Ostrya virginiana	Eastern Hop-hornbeam	S5							X	X					X	

Plant Species Reported from the Study Area - Upper West Side Urban Boundary Expansion (Project #1974E)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Hamilton	NHIC Data*	NRSI Observed	NRSI Tree Inventory Data	RES	MAM2-2	Orchard	CUM1	HD	CUT1-4
		MNRF 2020a	MNRF 2020a	Government of Canada 2019	Government of Canada 2019	Government of Canada 2019	Oldham 2017	MNRF 2019b	*Data from 2018 - 2020*							
Bignoniaceae	**Bignonia Family**															
Catalpa speciosa	Northern Catalpa	SE1							X	X						
Boraginaceae	**Borage Family**															
Hackelia virginiana	Virginia Stickseed	S5							X		X		X			
Symphytum officinale	Common Comfrey	SE5							X		X					
Brassicaceae	**Mustard Family**															
Alliaria petiolata	Garlic Mustard	SE5							X		X		X		X	
Barbarea vulgaris	Bitter Wintercress	SE5							X			X			X	
Erysimum cheiranthoides	Wormseed Wallflower	S5							X					X		
Hesperis matronalis	Dame's Rocket	SE5							X		X		X		X	
Lepidium campestre	Field Peppergrass	SE5							X						X	
Odontarrhena muralis	Wall Alyssum	SE1							X							X
Thlaspi arvense	Field Penny-cress	SE5							X		X					
Caprifoliaceae	**Honeysuckle Family**															
Lonicera tatarica	Tatarian Honeysuckle	SE5							X		X		X		X	X
Viburnum opulus	Cranberry Viburnum	S5					IX		X		X					
Caryophyllaceae	**Pink Family**															
Cerastium arvense	Field Chickweed	S4							X		X			X		X
Cerastium fontanum	Common Mouse-ear Chickweed	SE5							X		X		X			
Dianthus armeria	Deptford Pink	SE5							X							X
Chenopodiaceae	**Goosefoot Family**															
Chenopodium album	White Goosefoot	SE5							X		X					
Clusiaceae	**St. John's-wort Family**															
Hypericum punctatum	Spotted St. John's-wort	S5							X		X					
Cornaceae	**Dogwood Family**															
Cornus alternifolia	Alternate-leaved Dogwood	S5							X				X		X	
Cornus obliqua	Pale Dogwood	S5							X			X				
Cornus racemosa	Gray Dogwood	S5							X		X		X	X	X	X
Cornus sericea	Red-osier Dogwood	S5							X			X	X	X		
Cucurbitaceae	**Gourd Family**															
Echinocystis lobata	Wild Mock-cucumber	S5							X				X		X	
Dipsacaceae	**Teasel Family**															
Dipsacus fullonum	Common Teasel	SE5							X		X		X		X	
Fabaceae	**Pea Family**															
Gleditsia triacanthos	Honey-locust	S2?							X	X					X	
Lotus corniculatus	Garden Bird's-foot Trefoil	SE5							X				X	X		
Medicago sativa ssp. sativa	Alfalfa	SE5							X		X					
Melilotus albus	White Sweet-clover	SE5							X		X		X			
Robinia pseudoacacia	Black Locust	SE5							X	X	X					
Securigera varia	Common Crown-vetch	SE5							X				X			
Trifolium pratense	Red Clover	SE5							X		X					
Vicia cracca	Tufted Vetch	SE5							X				X	X		
Vicia sativa	Common Vetch	SE5							X				X	X		X
Vicia tetrasperma	Four-seeded Vetch	SE5							X					X		
Fagaceae	**Beech Family**															
Fagus grandifolia	American Beech	S4							X	X					X	
Quercus alba	White Oak	S5							X	X						
Quercus macrocarpa	Bur Oak	S5							X	X						
Quercus rubra	Northern Red Oak	S5							X	X	X					
Geraniaceae	**Geranium Family**															
Geranium maculatum	Spotted Geranium	S5							X		X				X	
Geranium robertianum	Herb-Robert	S5							X			X			X	
Grossulariaceae	**Currant Family**															
Ribes rubrum	Northern Red Currant	SE5							X						X	
Hippocastanaceae	**Buckeye Family**															
Aesculus hippocastanum	Horse Chestnut	SE2							X	X	X					
Hydrophyllaceae	**Water-leaf Family**															
Hydrophyllum virginianum	Virginia Waterleaf	S5							X						X	
Juglandaceae	**Walnut Family**															
Carya cordiformis	Bitternut Hickory	S5							X	X				X		
Carya ovata	Shagbark Hickory	S5							X						X	
Carya ovata var. ovata	Shagbark Hickory	S5							X	X						
Juglans cinerea	Butternut	S2?	END	END	Endangered	Schedule 1			X	X			X		X	
Juglans nigra	Black Walnut	S4?							X	X	X	X	X	X		
Lamiaceae	**Mint Family**															
Glechoma hederacea	Ground Ivy	SE5							X		X					
Pycnanthemum virginianum	Virginia Mountain-mint	S4							X				X	X		X

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		MNRF 2020a	MNRF 2020a	Government of Canada 2019	Government of Canada 2019	Government of Canada 2019	Oldham 2017	MNRF 2019b	*Data from 2018 - 2020*							
Lythraceae	**Loosestrife Family**															
Lythrum salicaria	Purple Loosestrife	SE5							X			X	X			
Malvaceae	**Mallow Family**															
Abutilon theophrasti	Velvetleaf	SE5							X						X	
Moraceae	**Mulberry Family**															
Morus alba	White Mulberry	SE5							X	X	X					
Oleaceae	**Olive Family**															
Fraxinus americana	White Ash	S4							X	X						
Syringa vulgaris	Common Lilac	SE5							X		X					
Onagraceae	**Evening-primrose Family**															
Circaea canadensis ssp. canadensis	Canada Enchanter's Nightshade	S5					C		X		X					
Oenothera biennis	Common Evening-primrose	S5							X		X					
Oenothera perennis	Perennial Evening-primrose	S5							X					X		X
Oxalidaceae	**Wood Sorrel Family**															
Oxalis dillenii	Slender Yellow Wood-sorrel	S5?							X						X	
Papaveraceae	**Poppy Family**															
Chelidonium majus	Greater Celandine	SE5							X		X					
Polygonaceae	**Smartweed Family**															
Rumex acetosella	Sheep Sorrel	SE5							X							X
Rumex crispus	Curly Dock	SE5							X		X					
Pyrolaceae	**Wintergreen Family**															
Chimaphila maculata	Spotted Wintergreen	S2	THR	THR	Endangered	Schedule 1		X								
Ranunculaceae	**Buttercup Family**															
Ranunculus acris	Tall Buttercup	SE5							X				X			
Ranunculus hispidus	Bristly Buttercup	S3					R		X			X				
Ranunculus sceleratus var. sceleratus	Cursed Buttercup	SE							X					X	X	
Rhamnaceae	**Buckthorn Family**															
Rhamnus cathartica	Common Buckthorn	SE5							X		X		X	X	X	
Rosaceae	**Rose Family**															
Agrimonia gryposepala	Hooked Agrimony	S5							X				X			
Amelanchier arborea	Downy Serviceberry	S5							X		X					
Crataegus sp.	Hawthorn sp.	0	0	0		0			X	X			X	X	X	X
Fragaria virginiana	Wild Strawberry	S5							X		X			X	X	X
Geum aleppicum	Yellow Avens	S5							X				X			
Malus pumila	Common Apple	SE4							X		X				X	
Potentilla recta	Sulphur Cinquefoil	SE5							X						X	
Prunus avium	Sweet Cherry	SE4							X	X	X				X	
Prunus domestica	European Plum	SE2							X	X						
Prunus nigra	Canada Plum	S4							X		X					
Prunus pensylvanica	Pin Cherry	S5							X						X	
Prunus serotina	Black Cherry	S5							X	X					X	
Pyrus communis	Common Pear	SE4							X	X			X			X
Rosa multiflora	Multiflora Rose	SE5							X		X		X	X		
Rubus allegheniensis	Allegheny Blackberry	S5							X						X	
Rubus idaeus ssp. strigosus	Wild Red Raspberry	S5							X		X		X		X	
Rubus occidentalis	Black Raspberry	S5							X		X		X			
Rubiaceae	**Madder Family**															
Galium aparine	Cleavers	S5							X		X	X	X			
Salicaceae	**Willow Family**															
Populus balsamifera	Balsam Poplar	S5							X	X						
Populus deltoides	Eastern Cottonwood	S5							X	X						
Populus deltoides ssp. deltoides	Eastern Cottonwood	S5					C		X		X					
Populus tremuloides	Trembling Aspen	S5							X				X		X	
Salix alba	White Willow	SE4							X	X						
Salix amygdaloides	Peach-leaved Willow	S5							X	X						
Salix bebbiana	Bebb's Willow	S5							X	X						
Salix euxina	Crack Willow	SE							X							
Salix nigra	Black Willow	S4							X	X						
Scrophulariaceae	**Figwort Family**															
Gratiola neglecta	Clammy Hedge-hyssop	S4							X			X				
Linaria vulgaris	Butter-and-eggs	SE5							X				X			
Verbascum thapsus	Common Mullein	SE5							X				X			
Veronica peregrina ssp. peregrina	Purslane Speedwell	S5							X					X		
Simaroubaceae	**Ailanthus Family**															
Ailanthus altissima	Tree-of-heaven	SE5							X	X	X					
Solanaceae	**Nightshade Family**															
Datura stramonium	Jimson Weed	SE5							X		X					

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		MNRF 2020a	MNRF 2020a	Government of Canada 2019	Government of Canada 2019	Government of Canada 2019	Oldham 2017	MNRF 2019b	*Data from 2018 - 2020*							
Solanum dulcamara	Bittersweet Nightshade	SE5							X						X	
Tiliaceae	**Linden Family**															
Tilia americana	American Basswood	S5							X	X						
Tilia cordata	Little-leaf Linden	SE1							X	X						
Ulmaceae	**Elm Family**															
Ulmus americana	American Elm	S5							X	X		X			X	
Ulmus rubra	Slippery Elm	S5							X	X						
Urticaceae	**Nettle Family**															
Urtica dioica ssp. gracilis	Slender Stinging Nettle	S5							X			X			X	
Verbenaceae	**Vervain Family**															
Verbena hastata	Blue Vervain	S5							X			X	X		X	
Verbena urticifolia	White Vervain	S5							X		X		X	X		
Vitaceae	**Grape Family**															
Parthenocissus quinquefolia	Virginia Creeper	S4?							X			X	X			
Vitis labrusca	Fox Grape	S1							X							X
Vitis riparia	Riverbank Grape	S5							X		X	X	X	X	X	
Cyperaceae	**Sedge Family**															
Carex blanda	Woodland Sedge	S5							X				X		X	X
Carex normalis	Larger Straw Sedge	S4							X					X		
Carex stipata	Awl-fruited Sedge	S5							X					X		
Carex vulpinoidea	Fox Sedge	S5							X			X			X	
Scirpus atrovirens	Dark-green Bulrush	S5							X						X	
Juncaceae	**Rush Family**															
Juncus tenuis	Path Rush	S5							X				X	X		
Liliaceae	**Lily Family**															
Allium schoenoprasum var. schoenoprasu	European Chives	SE2					IR		X			X				
Asparagus officinalis	Garden Asparagus	SE5							X					X		
Hemerocallis fulva	Orange Daylily	SE5							X		X					
Maianthemum racemosum	Large False Solomon's Seal	S5							X						X	
Polygonatum biflorum	Giant Solomon's Seal	S4							X		X					
Uvularia perfoliata	Perfoliate Bellwort	S1S2						X								
Poaceae	**Grass Family**															
Agrostis gigantea	Redtop	SE5							X							X
Bromus inermis	Smooth Brome	SE5							X				X	X	X	
Dactylis glomerata	Orchard Grass	SE5							X		X		X	X	X	X
Glyceria striata	Fowl Mannagrass	S5							X			X				
Phalaris arundinacea	Reed Canary Grass	S5							X		X	X	X	X	X	
Phragmites australis	Common Reed	S4?							X		X					
Poa compressa	Canada Bluegrass	SE5							X		X					
Poa palustris	Fowl Bluegrass	S5							X			X				
Poa pratensis ssp. pratensis	Kentucky Bluegrass	SE5							X		X		X	X	X	
Puccinellia nuttalliana	Nuttall's Alkaligrass	SE3							X			X				
Typhaceae	**Cattail Family**															
Typha latifolia	Broad-leaved Cattail	S5							X			X			X	
Total								**2**	**183**	**42**	**74**	**31**	**63**	**41**	**68**	**24**

*NHIC Atlas Squares: 17NH8682, 17NH8683, 17NH8782, 17NH8783, 17NH8882, 17NH8883, 17NH8981

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Appendix VI
Bird Species Reported from the Study Area

Bird Species Reported from the Study Area - Upper West Side Urban Boundary Expansion (Project #1974E)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	NPCA Status	Hamilton Status 2014	OBBA*	NHIC Data**	NRSI Observed: Highest Level of Breeding Evidence	East 'A' Block (BBS-007)	East 'B' Block (BBS-009)	Central Block (BBS-001 and BBS-004)	West Block (Birds Observed During Non-Target Surveys)
		MNRF 2020a	MNRF 2020a	Government of Canada 2019	Government of Canada 2019	Government of Canada 2019	NPCA 2010	HCA 2014	Cadman et al. 2007	MNRF 2020b	*Data from 2018-2020*				
Anatidae	**Ducks, Geese & Swans**														
Aix sponsa	Wood Duck	S5					U	U	PR						
Anas platyrhynchos	Mallard	S5					C	C	CO		**OB**				OB
Branta canadensis	Canada Goose	S5					VC	C	CO		**OB**		OB		OB
Bucephala albeola	Bufflehead	S4					O				**OB**				OB
Cygnus olor	Mute Swan	SNA					R	R (I)	CO						
Odontophoridae	**New World Quails**														
Colinus virginianus	Northern Bobwhite	S1	END	E	E	Schedule 1	EX	EX		X					
Phasianidae	**Partridges, Grouse & Turkeys**														
Bonasa umbellus	Ruffed Grouse	S4					R	U	CO						
Meleagris gallopavo	Wild Turkey	S5					U	C			**PO**		PO		OB
Phasianus colchicus	Ring-necked Pheasant	SNA					I, R	R (I)	PR						
Columbidae	**Pigeons & Doves**														
Columba livia	Rock Pigeon	SNA					VC	A	CO		**OB**			OB	
Zenaida macroura	Mourning Dove	S5					VC	A	CO		**PR**	PR		PO	OB
Cuculiformes	**Cuckoos & Anis**														
Coccyzus americanus	Yellow-billed Cuckoo	S4B					U	R	PR						
Coccyzus erythropthalmus	Black-billed Cuckoo	S5B					U	U	PR						
Coccyzus sp.	Black/Yellow-billed Cuckoo	NP							PO						
Apodidae	**Swifts**														
Chaetura pelagica	Chimney Swift	S4B,S4N	THR	T	T	Schedule 1	U	U	PR		**OB**			OB	
Trochilidae	**Hummingbirds**														
Archilochus colubris	Ruby-throated Hummingbird	S5B					U	U	CO						
Rallidae	**Rails, Gallinules & Coots**														
Porzana carolina	Sora	S4B					U	U	PO						
Rallus limicola	Virginia Rail	S5B					R	U	PR						
Gruidae	**Cranes**														
Antigone canadensis	Sandhill Crane	S5B		NAR	NS	No schedule	R	R			**OB**				OB
Charadriidae	**Plovers & Lapwings**														
Charadrius vociferus	Killdeer	S5B,S5N					C	A	PR		**CO**		PR	PO	CO
Scolopacidae	**Sandpipers & Allies**														
Actitis macularia	Spotted Sandpiper	S5					C	C	PR		**OB**				OB
Bartramia longicauda	Upland Sandpiper	S4B					R	R	PR						
Scolopax minor	American Woodcock	S4B					U	C	PR						
Laridae	**Gulls, Terns & Skimmers**														
Larus delawarensis	Ring-billed Gull	S5B,S4N					VC	A			**OB**		OB	OB	OB
Phalacrocoracidae	**Cormorants**														
Phalacrocorax auritus	Double-crested Cormorant	S5B	NAR	NAR	NS	No schedule	VC	A			**OB**				OB
Ardeidae	**Herons & Bitterns**														
Ardea herodias	Great Blue Heron	S4					U	U			**OB**				OB
Butorides virescens	Green Heron	S4B					U	U	PR						
Cathartidae	**Vultures**														
Cathartes aura	Turkey Vulture	S5B					U	U	CO		**OB**				OB
Accipitridae	**Hawks, Kites, Eagles & Allies**														
Accipiter cooperii	Cooper's Hawk	S4	NAR	NAR	NS	No schedule	U	U	CO						
Accipiter striatus	Sharp-shinned Hawk	S5	NAR	NAR	NS	No schedule	U	R	CO						
Buteo jamaicensis	Red-tailed Hawk	S5	NAR	NAR	NS	No schedule	U	C	CO						
Buteo platypterus	Broad-winged Hawk	S5B					O	R	CO						
Circus hudsonius	Northern Harrier	S4B	NAR	NAR	NS	No schedule	R	R	PR						
Tytonidae	**Barn Owls**														
Tyto alba	Barn Owl	S1	END	E	E	Schedule 1		EX	PR						
Strigidae	**Typical Owls**														
Bubo virginianus	Great Horned Owl	S4					U	C	PO						
Megascops asio	Eastern Screech-Owl	S4	NAR	NAR	NS	No schedule	U	U	PO						
Alcedinidae	**Kingfishers**														
Megaceryle alcyon	Belted Kingfisher	S4B					U	U	CO		**OB**				OB
Picidae	**Woodpeckers**														
Colaptes auratus	Northern Flicker	S4B					C	C	CO		**PO**			PO	
Dryobates pubescens	Downy Woodpecker	S5					C	C	CO						
Dryobates villosus	Hairy Woodpecker	S5						U	CO						
Dryocopus pileatus	Pileated Woodpecker	S5					R	U	PR						
Melanerpes carolinus	Red-bellied Woodpecker	S4					U	U	PR		**PO**	OB		PO	
Tyrannidae	**Tyrant Flycatchers**														
Contopus virens	Eastern Wood-Pewee	S4B	SC	SC	SC	Schedule 1	C	C	PR	X	**PO**			PO	OB

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		MNRF 2020a	MNRF 2020a	Government of Canada 2019	Government of Canada 2019	Government of Canada 2019	NPCA 2010	HCA 2014	Cadman et al. 2007	MNRF 2020b	*Data from 2018-2020*				
Empidonax alnorum	Alder Flycatcher	S5B					U	U	PR						
Empidonax minimus	Least Flycatcher	S4B					U	U	PR						
Empidonax traillii	Willow Flycatcher	S5B					U	C	CO		**PR**	PR		PR	
Myiarchus crinitus	Great Crested Flycatcher	S4B					C	C	PR		**OB**				OB
Sayornis phoebe	Eastern Phoebe	S5B					C	U	CO						
Tyrannus tyrannus	Eastern Kingbird	S4B					C	A	CO		**PO**			PO	OB
Vireonidae	**Vireos**														
Vireo flavifrons	Yellow-throated Vireo	S4B					R	U	PO						
Vireo gilvus	Warbling Vireo	S5B					C	C	PR						
Vireo olivaceus	Red-eyed Vireo	S5B					C	C	CO						
Corvidae	**Crows & Jays**														
Corvus brachyrhynchos	American Crow	S5B					C	C	CO		**PO**	OB	PO	PO	OB
Cyanocitta cristata	Blue Jay	S5					VC	A	CO		**PR**	PO		PR	OB
Alaudidae	**Larks**														
Eremophila alpestris	Horned Lark	S5B					C	C	PR		**PO**		PO		
Hirundinidae	**Swallows**														
Hirundo rustica	Barn Swallow	S5B	THR	T	T	Schedule 1	VC	C	CO		**PR**		PR		PR
Riparia riparia	Bank Swallow	S4B	THR	T	T	Schedule 1	VC	U	CO						
Stelgidopteryx serripennis	Northern Rough-winged Swallow	S4B					U	C	CO						
Tachycineta bicolor	Tree Swallow	S4B					VC	A	CO		**OB**				OB
Paridae	**Chickadees & Titmice**														
Baeolophus bicolor	Tufted Titmouse	S4					R	R	CO						
Poecile atricapillus	Black-capped Chickadee	S5					C	A	CO		**PO**			PO	OB
Sittidae	**Nuthatches**														
Sitta canadensis	Red-breasted Nuthatch	S5					R	U	CO						
Sitta carolinensis	White-breasted Nuthatch	S5					U	C	CO						
Certhiidae	**Creepers**														
Certhia americana	Brown Creeper	S5B					U	U	CO						
Troglodytidae	**Wrens**														
Cistothorus palustris	Marsh Wren	S4B					U	U	PR						
Cistothorus platensis	Sedge Wren	S4B	NAR	NAR	NS	No schedule	R	R	PR						
Thryothorus ludovicianus	Carolina Wren	S4					U	R	CO						
Troglodytes aedon	House Wren	S5B					C	C	CO		**PR**	PO	PO	PR	
Troglodytes hiemalis	Winter Wren	S5B					R	U	PR						
Polioptilidae	**Gnatcatchers**														
Polioptila caerulea	Blue-gray Gnatcatcher	S4B					U	U	CO						
Turdidae	**Thrushes**														
Catharus fuscescens	Veery	S4B					U	C	CO						
Hylocichla mustelina	Wood Thrush	S4B	SC	T	T	Schedule 1	U	C	CO						
Sialia sialis	Eastern Bluebird	S5B	NAR	NAR	NS	No schedule	U	U	CO						
Turdus migratorius	American Robin	S5B					VC	A	CO		**CO**	PO	CO	CO	OB
Mimidae	**Mockingbirds, Thrashers & Allies**														
Dumetella carolinensis	Gray Catbird	S4B					C	A	CO		**PO**			PO	
Mimus polyglottos	Northern Mockingbird	S4					U	U	CO						
Toxostoma rufum	Brown Thrasher	S4B					U	U	CO						
Sturnidae	**Starlings**														
Sturnus vulgaris	European Starling	SNA					VC	A (I)	CO		**PO**	OB	PO		OB
Bombycillidae	**Waxwings**														
Bombycilla cedrorum	Cedar Waxwing	S5B					C	C	CO		**CO**	PO	CO		
Passeridae	**Old World Sparrows**														
Passer domesticus	House Sparrow	SNA					VC	A (I)	CO						
Fringillidae	**Finches & Allies**														
Haemorhous mexicanus	House Finch	SNA					C	A (I)	CO						
Spinus tristis	American Goldfinch	S5B					C	A	CO		**PR**	PR		PR	OB
Emberizidae	**New World Sparrows & Allies**														
Ammodramus savannarum	Grasshopper Sparrow	S4B	SC	SC	SC	Schedule 1	C	U	PR						
Melospiza georgiana	Swamp Sparrow	S5B					U	C	CO						
Melospiza melodia	Song Sparrow	S5B					VC	A	CO		**PR**	PR	PR	PR	OB
Passerculus sandwichensis	Savannah Sparrow	S4B					VC	A	CO		**OB**				OB
Pipilo erythrophthalmus	Eastern Towhee	S4B					U	U	PR						
Pooecetes gramineus	Vesper Sparrow	S4B					U	U	PR						
Spizella pallida	Clay-colored Sparrow	S4B						R	PR						
Spizella passerina	Chipping Sparrow	S5B					C	A	CO		**OB**				OB
Spizella pusilla	Field Sparrow	S4B					U	C	PR		**OB**				OB

Bird Species Reported from the Study Area - Upper West Side Urban Boundary Expansion (Project #1974E)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	NPCA Status	Hamilton Status 2014	OBBA*	NHIC Data**	NRSI Observed: Highest Level of Breeding Evidence	East 'A' Block (BBS-007)	East 'B' Block (BBS-009)	Central Block (BBS-001 and BBS-004)	West Block (Birds Observed During Non-Target Surveys)
		MNRF 2020a	MNRF 2020a	Government of Canada 2019	Government of Canada 2019	Government of Canada 2019	NPCA 2010	HCA 2014	Cadman et al. 2007	MNRF 2020b	*Data from 2018-2020*				
Zonotrichia albicollis	White-throated Sparrow	S5B					O	U	PO						
Icteriidae	**Chats**														
Icteria virens	Yellow-breasted Chat	S1B	END	E	E	Schedule 1	R	R	PO						
Icteridae	**Troupials & Allies**														
Agelaius phoeniceus	Red-winged Blackbird	S4					VC	A	CO		**PR**	PO	PR	PR	OB
Dolichonyx oryzivorus	Bobolink	S4B	THR	T	T	Schedule 1	U	U	PR						
Icterus galbula	Baltimore Oriole	S4B					C	C	CO		**PO**			PO	
Icterus spurius	Orchard Oriole	S4B					U	U	CO						
Molothrus ater	Brown-headed Cowbird	S4B					VC	A	CO		**PO**		PO	PO	OB
Quiscalus quiscula	Common Grackle	S5B					VC	A	CO		**PR**		PR		OB
Sturnella magna	Eastern Meadowlark	S4B	THR	T	T	Schedule 1	U	U	PR		**OB**	OB			
Parulidae	**Wood Warblers**														
Geothlypis philadelphia	Mourning Warbler	S4B					U	U	PR						
Geothlypis trichas	Common Yellowthroat	S5B					C	C	CO		**PR**	PR		PR	
Mniotilta varia	Black-and-white Warbler	S5B					R	U	PO						
Parkesia motacilla	Louisiana Waterthrush	S3B	THR	T	T	Schedule 1	R	R	PR						
Seiurus aurocapilla	Ovenbird	S4B						C	PR						
Setophaga caerulescens	Black-throated Blue Warbler	S5B					R	R	PO						
Setophaga citrina	Hooded Warbler	S4B	NAR	NAR	NS	No schedule	R	R	PR						
Setophaga magnolia	Magnolia Warbler	S5B						R	PO						
Setophaga pensylvanica	Chestnut-sided Warbler	S5B					U	U	CO						
Setophaga petechia	Yellow Warbler	S5B					C	A	CO		**PR**	PR	PO	PR	
Setophaga pinus	Pine Warbler	S5B						U	PR						
Setophaga ruticilla	American Redstart	S5B					U	U	CO		**PO**			PO	
Setophaga virens	Black-throated Green Warbler	S5B					R	R	CO						
Vermivora chrysoptera	Golden-winged Warbler	S4B	SC	T	T	Schedule 1	R	R	PR						
Vermivora cyanoptera	Blue-winged Warbler	S4B					U	U	CO						
Cardinalidae	**Cardinals, Grosbeaks & Allies**														
Cardinalis cardinalis	Northern Cardinal	S5					C	A	CO		**PR**	PO	PR	PR	OB
Passerina cyanea	Indigo Bunting	S4B					C	C	CO						
Pheucticus ludovicianus	Rose-breasted Grosbeak	S4B					C	C	CO						
Piranga olivacea	Scarlet Tanager	S4B					U	U	PR						
Total									**112**	**2**	**46**	**16**	**17**	**25**	**32**

*OBBA Atlas Square: 17NH88

**NHIC Atlas Squares: 17NH8682, 17NH8683, 17NH8782, 17NH8783, 17NH8882, 17NH8883, 17NH8981

References

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Appendix VII
Herpetofauna Species Reported from the Study Area

Reptile and Amphibian Species Reported from the Study Area - Upper West Side Urban Boundary Expansion (Project #1974E)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Hamilton Status	ORAA*	NHIC Data**	NRSI Observed	East 'A' Block	East 'B' Block	Central Block	West Block
		MNRF 2019a	MNRF 2019a	Government of Canada 2019	Government of Canada 2019	Government of Canada 2019	HCA 2013	Ontario Nature 2019	MNRF 2020b	*Data from 2018-2020*				
Turtles														
Chelydra serpentina	Snapping Turtle	S4	SC	SC	SC	Schedule 1	C	X		X				X
Chrysemys picta marginata	Midland Painted Turtle	S4		SC	NS	No schedule	C	X		X				X
Snakes														
Diadophis punctatus	Northern Ring-necked Snake	S4					R	X						
Lampropeltis triangulum	Milksnake	S4	NAR	SC	SC	Schedule 1	U	X						
Storeria dekayi	Dekay's Brownsnake	S5	NAR	NAR	NS	No schedule	U	X		X	X		X	X
Storeria occipitomaculata	Red-bellied Snake	S5					R	X		X	X		X	X
Thamnophis sirtalis sirtalis	Eastern Gartersnake	S5					C	X		X		X	X	X
Salamanders														
Ambystoma sp.	Jefferson/Blue-spotted Salamander Complex	NP						X						
Ambystoma jeffersonianum	Jefferson Salamander	S2	END	E	E	Schedule 1	R	X						
Ambystoma laterale	Blue-spotted Salamander	S4					R	X						
Ambystoma maculatum	Spotted Salamander	S4					R	X						
Notophthalmus viridescens viridescens	Red-spotted Newt	S5					R	X						
Plethodon cinereus	Eastern Red-backed Salamander	S5					C	X						
Frogs and Toads														
Anaxyrus americanus	American Toad	S5					C	X		X		X	X	X
Hyla versicolor	Gray Treefrog	S5					C	X		X		X	X	X
Pseudacris triseriata pop. 2	Western Chorus Frog (Great Lakes / St. Lawrence - Canadian Shield population)	S4	NAR	T	T	Schedule 1	C	X						
Pseudacris crucifer	Spring Peeper	S5					C	X		X		X	X	X
Lithobates catesbeianus	American Bullfrog	S4					U	X						
Lithobates clamitans	Green Frog	S5					C	X		X				X
Lithobates palustris	Pickerel Frog	S4	NAR	NAR	NS	No schedule	R	X						
Lithobates pipiens	Northern Leopard Frog	S5	NAR	NAR	NS	No schedule	C	X		X		X	X	X
Lithobates sylvaticus	Wood Frog	S5					C	X						
Total								**22**	**0**	**10**	**2**	**5**	**8**	**10**

*ORAA Atlas Square: 17NH88

**NHIC Atlas Squares: 17NH8682, 17NH8683, 17NH8782, 17NH8783, 17NH8882, 17NH8883, 17NH8981

References

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Appendix VIII
Mammal Species Reported from the Study Area

Mammal Species Reported from the Study Area - Upper West Side Urban Boundary Expansion (Project #1974E)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Ontario Mammal Atlas	NRSI Observed	East 'A' Block	East 'B' Block	Central Block	West Block
		MNRF 2020a	MNRF 2020a	Government of Canada 2019	Government of Canada 2019	Government of Canada 2019	Dobbyn 1994	*Data from 2018-2020*				
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					
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 lucifugus	Little Brown Myotis	S3	END	E	E	Schedule 1	X					
Myotis septentrionalis	Northern Myotis	S3	END	E	E	Schedule 1	X					
Perimyotis subflavus	Tri-colored Bat	S3?	END	E	E	Schedule 1	X					
Lagomorpha	**Rabbits and Hares**											
Lepus europaeus	European Hare	SNA					X					
Sylvilagus floridanus	Eastern Cottontail	S5					X	X				X
Rodentia	**Rodents**											
Castor canadensis	Beaver	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	X		X		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	X				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			X	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	X	X		X	X
Urocyon cinereoargenteus	Gray Fox	S1	THR	T	T	Schedule 1	X					
Vulpes vulpes	Red Fox	S5					X					
Mephitidae	**Skunks and Stink Badgers**											
Mephitis mephitis	Striped Skunk	S5					X					
Mustelidae	**Weasels and Allies**											
Mustela erminea	Ermine	S5					X					
Mustela frenata	Long-tailed Weasel	S4					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	X	X	X	X	X
Artiodactyla	**Deer and Bison**											
Odocoileus virginianus	White-tailed Deer	S5					X	X	X		X	X
Total							**41**	**7**	**3**	**2**	**4**	**7**

*Mammal Atlas Square Numbers: NT88
**NHIC Atlas Squares: 17NH8682, 17NH8683, 17NH8782, 17NH8783, 17NH8882, 17NH8883, 17NH8981

References

Ministry of Natural Resources and Forestry (MNRF). 2020a. Natural Heritage Information Centre (NHIC): Species List for Ontario. Published: 2014-07-17. All Species List Updated: 2020-01-17. Available: https://www.ontario.ca/page/get-natural-heritage-information

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Appendix IX
Butterfly Species Reported from the Study Area

Butterfly Species Reported from the Study Area - Upper West Side Urban Boundary Expansion (Project #1974E)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Hamilton Status	NPCA Status	TEA Atlas*	NHIC Data**	NRSI Observed	East 'A' Block	East 'B' Block	Central Block	West Block
		MNRF 2020a	MNRF 2020a	Government of Canada 2019	Government of Canada 2019	Government of Canada 2019	HCA 2013	NPCA 2010	Macnaughton et al. 2020	MNRF 2020b	*Data from 2018-2020*				
Hesperiidae	**Skippers**														
Anatrytone logan	Delaware Skipper	S4					C	U	X		X	X			
Ancyloxypha numitor	Least Skipper	S5					C	C	X		X	X		X	
Epargyreus clarus	Silver-spotted Skipper	S4					C	U	X						
Erynnis baptisiae	Wild Indigo Duskywing	S4					U	C	X						
Erynnis juvenalis	Juvenal's Duskywing	S5					C	C	X						
Euphyes dion	Dion Skipper	S4					U	R	X						
Euphyes vestris	Dun Skipper	S5					C	U	X						
Poanes hobomok	Hobomok Skipper	S5					C	C	X		X				X
Poanes viator	Broad-winged Skipper	S4					C	R	X						
Polites mystic	Long Dash Skipper	S5					C	R	X						
Polites peckius	Peck's Skipper	S5					C	C	X						
Polites themistocles	Tawny-edged Skipper	S5					C	H	X						
Pompeius verna	Little Glassywing	S4					C	R	X						
Thymelicus lineola	European Skipper	SNA					C	C	X						
Wallengrenia egeremet	Northern Broken Dash	S5					C	C	X						
Papilionidae	**Swallowtails**														
Battus philenor	Pipevine Swallowtail	SNA					R	H	X						
Papilio cresphontes	Giant Swallowtail	S4					C	R	X		X	X		X	
Papilio glaucus	Eastern Tiger Swallowtail	S5					C	C	X		X				X
Papilio polyxenes	Black Swallowtail	S5					C	C	X		X			X	
Papilio troilus	Spicebush Swallowtail	S4					R	C	X						
Pieridae	**Whites and Sulphurs**														
Colias eurytheme	Orange Sulphur	S5					C	C	X						
Colias philodice	Clouded Sulphur	S5						C	X		X			X	
Pieris rapae	Cabbage White	SNA					C	I	X		X	X	X	X	X
Lycaenidae	**Harvesters, Coppers, Hairstreaks, Blues**														
Celastrina sp.	Azure species	SNA							X						
Cupido comyntas	Eastern Tailed Blue	S5					C	C	X		X				
Feniseca tarquinius	Harvester	S4					R		X						
Glaucopsyche lygdamus	Silvery Blue	S5					U		X						
Lycaena hyllus	Bronze Copper	S5					U	R	X						
Lycaena phlaeas	American Copper	S5					U	R	X						
Satyrium acadica	Acadian Hairstreak	S4					C	R	X						
Satyrium calanus	Banded Hairstreak	S4					C	C	X		X			X	
Satyrium caryaevorus	Hickory Hairstreak	S4					U	R	X						
Satyrium liparops	Striped Hairstreak	S5					C	U	X						
Nymphalidae	**Brush-footed Butterflies**														
Aglais milberti	Milbert's Tortoiseshell	S5					R	H	X						
Boloria bellona	Meadow Fritillary	S5					C	H	X						
Cercyonis pegala	Common Wood-Nymph	S5					C	C	X		X	X			
Coenonympha tullia	Common Ringlet	S5					C	C	X		X				
Danaus plexippus	Monarch	S2N,S4B	SC	E	SC	Schedule 1	C	C	X		X	X	X		X
Euphydryas phaeton	Baltimore Checkerspot	S4					U	R	X						
Lethe anthedon	Northern Pearly-Eye	S5					C	U	X		X				
Lethe appalachia	Appalachian Brown	S4					C	R	X						
Lethe eurydice	Eyed Brown	S5					C	R	X						
Limenitis archippus	Viceroy	S5					C	U	X		X			X	X
Limenitis arthemis arthemis	White Admiral	S5					U	R	X						
Limenitis arthemis astyanax	Red-spotted Purple	S5					C	C	X		X	X		X	
Megisto cymela	Little Wood-Satyr	S5					C	C	X						
Nymphalis antiopa	Mourning Cloak	S5					C	C	X		X				X
Nymphalis l-album	Compton Tortoiseshell	S5					U	H	X						
Phyciodes cocyta	Northern Crescent	S5						C	X		X	X			
Phyciodes tharos	Pearl Crescent	S4					C	C	X		X				
Polygonia comma	Eastern Comma	S5					C	C	X						
Polygonia interrogationis	Question Mark	S5					C	C	X		X	X			
Speyeria cybele	Great Spangled Fritillary	S5					C	C	X		X			X	
Vanessa atalanta	Red Admiral	S5					C	C	X		X			X	
Vanessa cardui	Painted Lady	S5					C	H	X						
Vanessa virginiensis	American Lady	S5					C	U	X		X	X		X	
Total									**56**	**0**	**23**	**10**	**2**	**11**	**6**

*TEA Atlas Square: 17NH88

**NHIC Atlas Squares: 17NH8682, 17NH8683, 17NH8782, 17NH8783, 17NH8882, 17NH8883, 17NH8981

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Appendix X
Odonata Species Reported from the Study Area

Odonata Species Reported from the Study Area - Upper West Side Urban Boundary Expansion (Project #1974E)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Hamilton Status	NPCA Status	Odonate Atlas*	NHIC Data**	NRSI Observed	NRSI Observed			
												Central	East A	East B	West
		MNRF 2020a	MNRF 2020a	Government of Canada 2019	Government of Canada 2019	Government of Canada 2019	HCA 2013	NPCA 2010	OOAD 2020	MNRF 2020b	*Data from 2018-2020*				
Calopterygidae	**Broadwinged Damselflies**														
Calopteryx maculata	Ebony Jewelwing	S5					C		X						
Coenagrionidae	**Narrow-winged Damselflies**														
Argia fumipennis violacea	Violet Dancer	S5					C	C	X						
Ischnura verticalis	Eastern Forktail	S5					C	C	X		X	X			
Aeshnidae	**Darners**														
Aeshna constricta	Lance-tipped Darner	S5					C	H			X		X		
Anax junius	Common Green Darner	S5					C	C			X	X	X		
Libellulidae	**Skimmers**														
Erythemis simplicicollis	Eastern Pondhawk	S5					C	C			X				
Libellula luctuosa	Widow Skimmer	S5					C	C			X				
Libellula pulchella	Twelve-spotted Skimmer	S5					C	C			X				
Pachydiplax longipennis	Blue Dasher	S5					C	C			X	X			
Plathemis lydia	Common Whitetail	S5					C	C			X				
Sympetrum internum	Cherry-faced Meadowhawk	S5					C	R			X	X			
Tramea lacerata	Black Saddlebags	S4					C	C			X	X	X		
Total									**1**	**0**	**10**	**5**	**3**	**0**	**0**

**Odonate Atlas Square Numbers: 17NH88*
***NHIC Atlas Squares: 17NH8682, 17NH8683, 17NH8782, 17NH8783, 17NH8882, 17NH8883, 17NH8981*

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Appendix XI
Ministry of the Environment, Conservation, and Parks Species at Risk Correspondence

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Memo

1974D

To:	**Ministry of the Environment, Conservation and Parks (MECP)**
From:	**Desta Frey, Natural Resource Solutions Inc (NRSI)**
Date:	**May 1, 2020**
Re:	**Upper West Side, Hamilton Ontario** **Species at Risk Screening and Field Work Program**

Introduction

Natural Resource Solutions Inc. (NRSI) was retained by the Upper West Side Landowners Group (UWSLG), care of Corbett Land Strategies (CLS), to complete natural heritage studies in support of several development applications for the lands referred to as the Upper West Side (UWS) block in Hamilton, Ontario. The UWS block is bounded by Twenty Road West to the north, Upper James Street to the east, Dickenson Road to the south, and Glancaster Road to the west (Map 1). The lands are in the Twenty Mile Creek watershed, which falls under the jurisdiction of the Niagara Peninsula Conservation Authority (NPCA), the Ministry of Natural Resources and Forestry Guelph District – Vineland Field Office, and the Ministry of the Environment, Conservation, and Parks (MECP) Guelph District.

The UWSLG has initiated the following development and planning processes, and applications:

- a Municipal Comprehensive Review (MCR) GRIDS 2 Process Employment Lands Review
- a Schedule 'C' Class Environmental Assessment (EA) for the extension of Garth Street and associated Collector Road Network
- Urban Boundary Expansion applications
- Draft Plan of Subdivision of the Garth Street corridor

The UWSLG intends to initiate the following additional development and planning processes and applications:

- secondary planning and Official Plan Amendment submissions for the urban boundary expansion areas, and
- several Draft Plan of Subdivision applications for the remaining lands in the UWS block.

NRSI was retained to complete natural heritage studies in support these various processes and applications. Through these studies, NRSI will determine the environmental opportunities and constraints to development, including Species at Risk (SAR) and their habitats.

NRSI biologists have reviewed available background information for the UWS block, and have been conducting field surveys on site since 2014. Based on the analysis of background information and field data collected to date, NRSI biologists have obtained an excellent understanding of confirmed and potential SAR and their habitats in the UWS block. This memo summarizes the results of the background review, existing field data analysis, and an up-to-date SAR screening for MECP staff review. The purpose of this SAR screening and field work

program memo is to confirm the scope of targeted SAR field work and analyses informing the natural heritage studies in the UWS block.

Background Data

The study area for the UWS block (Map 1) includes the participating landowners and the surrounding lands within at least 120m, and in the case of wildlife atlas data, up to 10km. Background information sources were reviewed to identify records of SAR reported from the study area and surrounding lands. Information sources included the following:

- Natural Heritage Information Centre Make-a-Map Application (MNRF 2020a);
- Ministry of Natural Resources and Forestry (MNRF) Guelph District – Vineland Field Office correspondence (MNRF 2018);
- City of Hamilton Species at Risk List (MNRF 2019);
- Department of Fisheries and Oceans (DFO) Aquatics Species at Risk Mapping (DFO 2019);
- Ontario Breeding Bird Atlas (Bird Studies Canada et al 2006);
- Ontario Reptile and Amphibian Atlas data (Ontario Nature 2019);
- Ontario Butterfly Atlas (Macnaughton et al. 2019);
- Atlas of the Mammals of Ontario (Dobbyn 1994);
- Ontario Odonate Atlas (OOAD 2019);
- E-bird online records (eBird 2019);
- iNaturalist online records – research grade observations (iNaturalist 2019);
- City of Hamilton Urban Official Plan (UHOP) (2013);
- City of Hamilton Rural Official Plan (RHOP) (2012)
- Twenty Mile Creek Watershed Plan (NPCA 2006);
- City of Hamilton Natural Areas Inventory Project 3rd Edition (HCA 2014);
- Natural Areas Inventory 2006-2009 Volume 1 (NPCA 2010);
- Airport Employment Growth District (AEGD) Subwatershed Study (Dillon Consulting Ltd. and Aquafor Beech Ltd. 2011);
- AEGD Subwatershed Study Implementation Document (Aquafor Beech Ltd. 2017); and
- Draft Natural Features and Headwater Characterization report (NRSI 2013) and associated addendum (NRSI 2014);

Existing Conditions

The approximately 395ha UWS block is dominated by active agricultural fields (row crops and sod). Occupied and abandoned residential dwellings and farm outbuildings are present throughout, as well as a golf course that is no longer operational. Ecological features in the UWS block include:

- Portions of the Upper Twenty Mile Creek Provincially Significant Wetland (PSW) complex;
- Other unevaluated wetlands;
- Upland deciduous and mixed woodlands, some of which are recognized as regionally significant;
- Deciduous and coniferous hedgerows;
- Headwater Drainage Features (HDFs);
- Anthropogenically modified online ponds;
- A few small meadows; and
- Naturalized orchard and golf course areas.

All HDFs are classified as Seasonal/Warmwater Type 2 Important or Type 3 Marginal Fish Habitat according to the AEGD Subwatershed Study and NPCA mapping (A. Parks, pers. comm.).

SAR Screening and Field Work Program

The results of the background information review indicate that numerous SAR are reported from the UWS study area. A preliminary screening was completed by comparing available habitats in the UWS block with the preferred habitat of these SAR. A number of SAR were screened out in the analysis based on several factors, which are listed in the screening table appended to this memo (Appendix I).

In total, 16 SAR have the potential to occur on site based on the habitats available. To date, NRSI biologists have confirmed the presence of 2 of these SAR on site: Butternut (*Juglans cinerea*) and Barn Swallow (*Hirundo rustica*). The presence of candidate roost trees with the potential to be used by Little Brown Myotis (*Myotis lucifungus*), Northern Myotis (*Myotis septentrionalis*) and Tri-colored Bat (*Perimyotis subflavus*) has also been confirmed.

- *Guidance on the requirement for and timing of additional surveys for Barn Swallow is requested from MECP.*

- *Guidance on the preferred approach for acoustic monitoring and/or exit surveys targeting SAR bats going forward in the planning process is requested from MECP.*

During 2018-2019 field surveys, a large number of Butternuts (>250) were found throughout the UWS block, with the greatest concentration occurring in the naturalized orchard directly south of Garth Street. Samples were taken from 17 individuals, believed to be parent trees, and sent for genetic testing in 2019. All of the sampled Butternuts were found to be pure. To date, NRSI's Certified Butternut Health Assessors have conducted health assessments for 141 Butternut on site. Of these, 50% were assessed as Category 1, 37% as Category 2, and 13% as Category 3.

- *Guidance on the preferred approach for conducting the remaining genetic testing on the large population of Butternuts on site is requested from MECP.*

Candidate habitat is present in the UWS block for several SAR that have not yet been observed on site by NRSI biologists to date. Field surveys are proposed to detect the presence of the following species (see Table 1 for survey details):

- American Chestnut (*Castanea dentata*);
- White Wood Aster (*Eurybia divaricate*);
- American Columbo (*Frasera caroliniensis);*
- Kentucky Coffee-tree (*Gymnocladus dioicus*);
- Cucumber Tree (*Magnolia acuminate*);
- Red Mulberry (*Morus rubra*)
- Chimney Swift (*Chaetura pelagica*);
- Bobolink (*Dolichonyx oryzivorus);*
- Eastern Meadowlark (*Sturnella magna);*
- Rusty-patched Bumble Bee (*Bombus affinis*); and
- Gypsy Cuckoo Bumble Bee (*Bombus bohemicus*).

Targeted field surveys are proposed for 2020 and beyond to address existing gaps in field data resulting from ongoing changes to the project schedule and the extent of the participating

properties in the UWS block. Seasonal field work to characterize the natural features in the UWS block will include standard surveys such as Ecological Land Classification (ELC), vegetation and wildlife inventories, and HDF and aquatic habitat assessments. The proposed field work components that will be conducted to specifically address SAR are detailed in Table 1. Table 1 also contains detailed information on the timing and protocol for each survey, and specifies the species or group of species that will be targeted by the survey. This SAR-specific field program was carefully designed to ensure the collection of relevant, comprehensive data that can be used to determine the presence of all significant species with records in the study area.

Proposed Undertaking

At this time, the UWS block is in the early stages of the development process. The opportunities and constraints identified by NRSI biologists through the review of background information and the analysis of field survey data will be used to identify a protected Natural Heritage System (NHS), will inform a block-wide community plan, and will feed into the secondary plans for the Urban Boundary Expansion areas and Draft Plans of Subdivision. To date, a preliminary community plan has been prepared by CLS in coordination with NRSI and the various engineering and planning project team members. The current framework plan includes an extensive NHS, which has been developed to protect and avoid direct impacts to the natural features on site, as much as possible. NRSI biologists will continue to work with the project team to minimize impacts to natural habitats. At the appropriate development stage for each area in the UWS block, a comprehensive suite of measures will be recommended to avoid and mitigate potential impacts to natural features and SAR. Buffers, in combination with other mitigation measures such as subdivision design, timing windows, stormwater management, sediment and erosion control, and construction-related protection will avoid and reduce potential impacts to natural features.

Table 1. Proposed SAR-Specific Field Work Program

Survey Type	Timing and Survey Notes	Protocol	Target SAR
3-season vascular flora inventories	3 surveys: • Spring (May to early June) • Summer (July to August) • Fall (September to October) A comprehensive area search of all ELC vegetation community units to record all vascular plant species observed.	n/a- area searches using professional experience and judgement were and will be used by NRSI staff in carrying out the surveys described in the column to the left.	Vascular Plant SAR
Tree Inventory	Assessment of all trees >10cm DBH by NRSI's Certified Arborists. Information collected has included or will include: • Tag number (where applicable) • Species (common and scientific name) • DBH measurement (cm) • Crown radius (m) • General health (good, fair, poor, dead) • Potential for structural failure (improbable, possible, probable, imminent) • Tree location (e.g. subject site) • General comments (i.e. disease, aesthetic quality, development constraints)	City of Hamilton's Tree Protection Guidelines (Appendix "A" to Report PD02229 (f) (City of Hamilton 2010)	Butternut *The purpose of the tree inventory as it pertains to Butternut is to continue identifying the location of all individuals within the UWS block during these detailed and comprehensive inventories.
Butternut Health Assessments and Genetic Testing	2 surveys between May 15 and August 31 *Guidance on the preferred approach for conducting the remaining genetic testing on the large population of Butternuts on site is requested from MECP.*	Butternut Assessment Guidelines: Assessment of Butternut Tree Health for the Purposes of the *Endangered Species Act, 2007* (MNRF 2014)	Butternut
Breeding Bird Surveys	3 surveys Conducted at least 1 week apart between May 21 and July 3. *Guidance on the requirement for and timing of additional surveys for Barn Swallow is requested from MECP.*	Ontario Breeding Bird Atlas Guide for Participants (OBBA 2001) and Bobolink/Eastern Meadowlark Survey Methodology (MNRF 2015)	Barn Swallow, Chimney Swift, Bobolink, Eastern Meadowlark
Surveys for Habitat of Little Brown	3 surveys during leaf-off conditions:	Phase 2 of the Survey Protocol for Species at Risk Bats in Treed	Little Brown Myotis, Northern Myotis

Table 1. Proposed SAR-Specific Field Work Program

Survey Type	Timing and Survey Notes	Protocol	Target SAR
Myotis and Northern Myotis	Survey 1: assess all isolated trees and trees in hedgerows for the presence of cavities or other features (e.g. loose bark, hollows) that may provide suitable roosting habitat for SAR bats. Survey 2: assess snag density in woodlot features. These plot-based surveys will assist in determining the presence of candidate high-quality bat maternity roosting habitat for SAR bats. Survey 3: conduct an investigation of all structures (e.g. residential dwellings, farm buildings) for their potential to house SAR bat colonies. *Guidance on the preferred approach for acoustic monitoring and/or exit surveys targeting Little Brown Myotis and Northern Myotis going forward in the planning process is requested from MECP.*	Habitats: Little Brown Myotis, Northern Myotis & Tri-Colored Bat (MNRF 2017)	
Surveys for Habitat of Tri-Colored Bat	During Tree Inventory surveys, all oak and maple trees ≥10cm DBH will be identified. *Guidance on the preferred approach for acoustic monitoring and/or exit surveys targeting Tri-colored Bat going forward in the planning process is requested from MECP.*	*Phase II: Identification of Suitable Roost Trees* of the Survey Protocol for Species at Risk Bats in Treed Habitats: Little Brown Myotis, Northern Myotis & Tri-Colored Bat (MNRF 2017)	Tri-colored Bat
Insect Surveys	3 surveys: • Late May/June • Mid-July • Mid-August Systematic area searches will be conducted between 08:00 and 14:00 by walking through all vegetation communities to capture the full range and diversity of habitat types. Each species will be captured if possible, identified, and information on behaviour recorded. Surveys will be conducted on sunny or partly-cloudy days when temperatures are 19°C or greater. Surveys will not occur if it is raining.	n/a- area searches using professional experience and judgement were used by NRSI staff in carrying out the surveys described in the column to the left.	Rusty-patched Bumble Bee and Gypsy Cuckoo Bumble Bee

Summary

The UWS block contains several ecological features, some of which are provincially and regionally significant. These features provide a variety of habitats that are suitable for a number of wildlife species, including SAR. A plan to address SAR has been provided in this memo. We request that MECP review this memo and provide their comment on the proposed approach.

For the SAR (Barn Swallow and Butternut) and SAR bat habitat that have already been confirmed in the UWS block, we request that MECP detail the next steps that are required to ensure that species and their habitat are addressed appropriately according to the *Endangered Species Act* (2007) throughout the planning approval process. Specifically, guidance is requested on:

- The requirement for and timing of additional surveys for Barn Swallow;
- The preferred approach for acoustic monitoring and/or exit surveys targeting SAR bats going forward in the planning process; and
- The preferred approach to testing the genetics of and planning for the large Butternut population.

Further information and input from MECP are requested regarding any additional known occurrences of SAR and the requirement for additional surveys or changes to the survey protocols.

Should you have any questions or comments regarding this proposal, please do not hesitate to contact the undersigned.

Sincerely,
Natural Resource Solutions Inc.

Desta Frey, M.Sc., P. Biol.
Terrestrial & Aquatic Biologist

Cc.: Nick Wood, Corbett Land Strategies
Candice Hood, Corbett Land Strategies
Nyssa Hardie, Natural Resource Solutions Inc.
Ryan Archer, Natural Resource Solutions Inc.

Encl.: Map 1 – Study Area
Appendix I – Preliminary Species at Risk Screening

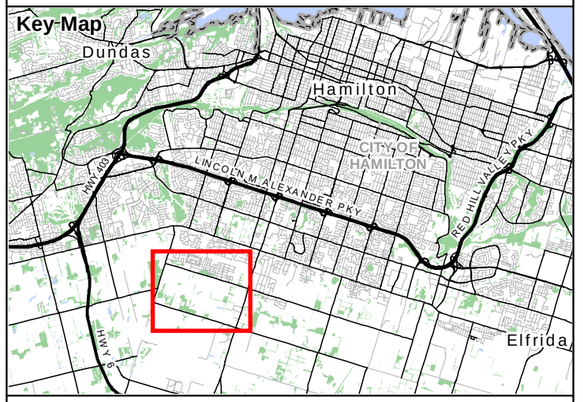
MAP 1

Study Area

Map 1

Upper West Side

Study Area



Legend

- UWS Block
- Participating Lands
- Primary Road
- Secondary Road
- Headwater Drainage Features
- Piped Headwater Drainage Features
- Water Body
- Upper Twenty Creek Provincially Significant Wetland
- Other Wetlands
- Significant Woodlot
- Other Woodlot

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1974D
Date: February 12, 2020

NAD83 - UTM Zone 17
Size: 11x17"
1:10,500

0 100 200 300 400 500 600 Metres

N

586500 587000 587500 588000 588500 589000 589500

4783500 4783000 4782500 4782000 4781500

Path: X:\1405_TwentyRdLandownersGroupAssessments\NRSI_1974D_MEMO_Map1_StudyArea_2020_02_12_KEF.mxd

APPENDIX I

Preliminary Species at Risk Screening

Species at Risk Screening- Upper West Side Block (Project#1974)

Scientific Name	Common Name	S-RANK	SARO	COSEWIC	SARA	SARA Schedule	Background Source	Habitat Preference	Suitable Habitat Present in Upper West Side Block?	Rationale
Reference		MNRF 2019a		Government of Canada 2019			*see below*	OMNR 2000, Oldham and Brinker 2009, Michigan Flora Online 2011, MECP 2019		
Vascular Plants										
Betula lenta	Cherry Birch	S1	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019b)	Moist, well-drained clay loam soil over limestone bedrock with White Oak, Red Oak, Eastern Hemlock, Sugar Maple and other deciduous trees.	No	Preferred habitat for this species is not present.
Castanea dentata	American Chestnut	S1S2	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019b)	Moist to well drained forests on sand, occasionally heavy soils.	Possible	NRSI biologists will conduct vegetation inventories to determine species presence.
Cornus florida	Eastern Flowering Dogwood	S2?	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019b)	Grows under taller trees in mid-age to mature deciduous or mixed forests. It most commonly grows on floodplains, slopes, bluffs and in ravines, and is also sometimes found along roadsides and fencerows.	No	Preferred habitat for this species is not present.
Eurybia divaricata	White Wood Aster	S2S3	THR	T	T	Schedule 1	SAR in Hamilton Region (MNRF 2019b)	Grows in open, dry deciduous forests that are dominated by Sugar maple and American beech trees. It is often found mixed in with other asters. The plant does best in well-drained soils and it may prefer a low level of disturbance, as it has been found to grow along trails. It does well in partial to full shade.	Possible	NRSI biologists will conduct vegetation inventories to determine species presence.
Frasera caroliniensis	American Columbo	S2	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019b)	Woodlands on sandy and clay soils.	Possible	NRSI biologists will conduct vegetation inventories to determine species presence.
Gymnocladus dioicus	Kentucky Coffee-tree	S2	THR	T	T	Schedule 1	SAR in Hamilton Region (MNRF 2019b)	Found in a variety of habitats, but grows best on moist, rich soil. Consequently, it is often found in floodplains, though it will tolerate shallow rocky or sandy soils. It is shade-intolerant, and therefore grows along the edges of woodlots or relies on canopy openings in forests and woodlots.	Possible	NRSI biologists will conduct vegetation inventories to determine species presence.
Juglans cinerea	Butternut	S2?	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019b)	Stream banks, swamps, and upland beech-maple, oak-hickory, and mixed hardwood stands.	Yes	NRSI biologists have confirmed the presence of Butternut during vegetation and tree inventories on lands within a subset of the Upper West Side Block. Vegetation and tree inventories will be conducted on all remaining lands to determine if the species is present elsewhere in the block. Butternut Health Assessments and genetic testing will be conducted.
Magnolia acuminata	Cucumber Tree	S2	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019b)	Rich, partly open, moist to wet woods.	Possible	NRSI biologists will conduct vegetation inventories to determine species presence.
Morus rubra	Red Mulberry	S2	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019b)	Moist woods and wooded river valleys.	Possible	NRSI biologists will conduct vegetation inventories to determine species presence.
Panax quinquefolius	American Ginseng	S2	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019b)	Deep leaf litter in rich, moist deciduous woods, especially on rocky, shaded cool slopes in sweet soil	No	Preferred habitat for this species is not present.
Pycnanthemum incanum var. *incanum*	Hoary Mountain-mint	S1	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019b)	Dry woodlands in partial shade of oaks and in openings.	No	Preferred habitat for this species is not present.
Tetraneuris herbacea	Lakeside Daisy	S3	THR	T	T	Schedule 1	SAR in Hamilton Region (MNRF 2019b)	Grassland and pavement alvars.	No	Preferred habitat for this species is not present.
Trichophorum planifolium	Bashful Clubrush	S1	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019b)	Open-canopied deciduous and mixed forests that have few shrubs in the understory. Requires warmth and good drainage.	No	Preferred habitat for this species is not present.
Birds										
Antrostomus vociferus	Eastern Whip-poor-will	S4B	THR	T	T	Schedule 1	SAR in Hamilton Region (MNRF 2019b)	Dry, open, deciduous woodlands of small to medium trees; oak or beech with lots of clearings and shaded leaflitter; wooded edges, forest clearings with little herbaceous growth; pine plantations; associated with >100 ha forests; may require 500 to 1000 ha to maintain population	No	Preferred habitat for this species is not present.
Calidris canutus	Red Knot	S1N	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019b)	Open beaches, mudflats, and coastal lagoons, where they feast on molluscs, crustaceans, and other invertebrates. Also occur in small numbers during the fall in southern Ontario, along Great Lakes beaches and mudflats	No	Preferred habitat for this species is not present.
Centronyx henslowii	Henslow's Sparrow	SHB	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019b)	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; a moderate amount of moisture needed; requires a minimum tract of grassland of 40 ha, but usually in areas >100 ha	No	Preferred habitat for this species is not present.
Chaetura pelagica	Chimney Swift	S4B,S4N	THR	T	T	Schedule 1	OBBA (BSC et al. 2006), SAR in Hamilton Region (MNRF 2019b)	Commonly found in urban areas near buildings; nests in hollow trees, crevices of rock cliffs, chimneys; highly gregarious; feeds over open water	Possible	Several old residential buildings that may have uncapped chimneys are present in the Upper West Side Block. Breeding bird surveys will be conducted to determine if the species is present.
Charadrius melodus	Piping Plover	S1B	END	N-A	NS	No schedule	SAR in Hamilton Region (MNRF 2019b)	Dry, sandy outer beaches; upper stretches near dunes, usually large open, grassless areas, but sometimes with sparse scattering of beach grass; recreational uses of beaches results in habitat loss	No	Preferred habitat for this species is not present.

Species at Risk Screening- Upper West Side Block (Project#1974)

Scientific Name	Common Name	S-RANK	SARO	COSEWIC	SARA	SARA Schedule	Background Source	Habitat Preference	Suitable Habitat Present in Upper West Side Block?	Rationale
Reference		MNRF 2019a		Government of Canada 2019			*see below*	OMNR 2000, Oldham and Brinker 2009, Michigan Flora Online 2011, MECP 2019		
Dolichonyx oryzivorus	Bobolink	S4B	THR	T	T	Schedule 1	OBBA (BSC et al. 2006), SAR in Hamilton Region (MNRF 2019b)	Large, open expansive grasslands with dense ground cover; hayfields, meadows or fallow fields; marshes; requires tracts of grassland >50 ha	Possible	Habitat for this species may be present in the western portion of the Upper West Side Block, in the naturalizing fairways of an inactive golf course. Breeding bird surveys following approved methodology for the species will be conducted to determine if the species is present.
Empidonax virescens	Acadian Flycatcher	S2S3B	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019b)	Mature, shady, deciduous forests; heavily wooded ravines; creek bottoms or river swamps; availability of good quality habitat is limiting factor; needs at least 30 ha of forest	No	Preferred habitat for this species is not present.
Hirundo rustica	Barn Swallow	S4B	THR	T	T	Schedule 1	OBBA (BSC et al. 2006), MNRF Records (MNRF 2018), SAR in Hamilton Region (MNRF 2019b)	Farmlands or rural areas; cliffs, caves, rock niches; buildings or other man-made structures for nesting; open country near body of water	Yes	NRSI biologists have confirmed that Barn Swallow is nesting and foraging on lands within a subset of the Upper West Side Block. Breeding bird surveys will be conducted to determine if the species is present elsewhere in the block.
Icteria virens	Yellow-breasted Chat	S1B	END	E	E	Schedule 1	OBBA (BSC et al. 2006), SAR in Hamilton Region (MNRF 2019b)	Thickets, tall tangles of shrubbery beside streams, ponds; overgrown bushy clearings with deciduous thickets; nests above ground in bush, vines etc.	No	Preferred habitat for this species is not present.
Ixobrychus exilis	Least Bittern	S4B	THR	T	T	Schedule 1	SAR in Hamilton Region (MNRF 2019b)	Deep marshes, swamps, bogs; marshy borders of lakes, ponds, streams, ditches; dense emergent vegetation of cattail, bulrush, sedge; nests in cattails; intolerant of loss of habitat and human disturbance	No	Preferred habitat for this species is not present.
Lanius ludovicianus	Loggerhead Shrike	S2B	END	E	NS	No schedule	SAR in Hamilton Region (MNRF 2019b)	Grazed pasture, marginal farmland with scattered hawthorn shrubs, hedgerows; fence posts, wires and associated low-lying wetland; located on core areas of limestone plain adjacent to Canadian Shield; greatest threat is fragmentation of suitable habitat due to natural succession; probably needs at least 25 ha of suitable habitat	No	Preferred habitat for this species is not present.
Parkesia motacilla	Louisiana Waterthrush	S3B	THR	T	T	Schedule 1	OBBA (BSC et al. 2006)	Prefers wooded ravines with running streams; also woodlands swamps; large tracts of mature deciduous or mixed forests; canopy cover is essential; has strong affinity to nest sites; nests on ground	No	Preferred habitat for this species is not present.
Pelecanus erythrorhynchos	American White Pelican	S2B	THR	NAR	NS	No schedule	SAR in Hamilton Region (MNRF 2019b)	Small, remote bedrock islands in freshwater permanent lakes; sparsely vegetated with grasses, nettles, shrubs, trees; intolerant of disturbance; colonial nester often with Double-crested Cormorants and Herring Gulls	No	Preferred habitat for this species is not present.
Protonotaria citrea	Prothonotary Warbler	S1B	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019b)	Area sensitive species preferring 100 ha of flooded or swampy woodlands with standing or flowing water and more than 25% canopy cover with numerous stumps and snags; stream borders or flooded bottomlands; soft, dead trees with dbh >10 cm; Carolinian species.	No	Preferred habitat for this species is not present.
Rallus elegans	King Rail	S2B	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019b)	Large, shallow, fresh water marshes, shrubby swamps, marshy borders of lakes and ponds with abundant vegetation; an 'edge' species; territories are 0.3 to 0.5 ha; loss of large marshes in the south is limiting to this species.	No	Preferred habitat for this species is not present.
Riparia riparia	Bank Swallow	S4B	THR	T	T	Schedule 1	OBBA (BSC et al. 2006), SAR in Hamilton Region (MNRF 2019b)	Sand, clay or gravel river banks or steep riverbank cliffs; lakeshore bluffs of easily crumbled sand or gravel; gravel pits, road-cuts, grassland or cultivated fields that are close to water; nesting sites are limiting factor for species presence.	No	Preferred habitat for this species is not present.
Setophaga cerulea	Cerulean Warbler	S3B	THR	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019b)	Mature deciduous woodland of Great Lakes- St. Lawrence and Carolinian forests, sometimes coniferous; swamps or bottomlands with large trees; area sensitive species needing extensive areas of forest (>100 ha).	No	Preferred habitat for this species is not present.
Sturnella magna	Eastern Meadowlark	S4B	THR	T	T	Schedule 1	OBBA (BSC et al. 2006), MNRF Records (MNRF 2018), SAR in Hamilton Region (MNRF 2019b)	Open, grassy meadows, farmland, pastures, hayfields or grasslands with elevated singing perches; cultivated land and weedy areas with trees; old orchards with adjacent, open grassy areas >10 ha in size.	Possible	Habitat for this species may be present in the western and central portion of the Upper West Side Block, in the naturalizing fairways of an inactive golf course and a naturalizing orchard. Breeding bird surveys following approved methodology for the species will be conducted to determine if the species is present.
Tyto alba	Barn Owl	S1	END	E	E	Schedule 1	OBBA (BSC et al. 2006), SAR in Hamilton Region (MNRF 2019b)	Open areas such as fields, agricultural lands with scattered woodlots, buildings and/or orchards; grasslands, sedge meadows, marshes; snow-cover limits ability to catch prey; species has intolerance to severe cold; nests in hollow trees and live trees >46 cm dbh; also nests in barns, abandoned buildings.	Possible, although occurrence on site considered extremely unlikely	Preferred habitat may be present, but the species is considered as extirpated in Hamilton Region (as per Hamilton Conservation Authority Natural Areas Inventory 2014). Occurences within any portion of Ontario are extremely rare.
Herpetofauna										
Ambystoma jeffersonianum	Jefferson Salamander	S2	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019b), ORAA (Ontario Nature 2019)	Damp shady deciduous forest, swamps, moist pasture, lakeshores; temporary woodland pools for breeding; hides under leaf litter, stones or in decomposing logs	No	Preferred habitat for this species is not present.
Ambystoma laterale - (2) jeffersonianum	Unisexual *Ambystoma* (Jefferson Salamander-dependent population)	S2	END	E	NS	No schedule	SAR in Hamilton Region (MNRF 2019b)	Damp shady deciduous forest, swamps, moist pasture, lakeshores; temporary woodland pools for breeding; hides under leaf litter, stones or in decomposing logs	No	Preferred habitat for this species is not present.
Apalone spinifera spinifera	Eastern Spiny Softshell	S2	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019b)	Intolerant of pollution; large river systems, shallow lakes and ponds with muddy bottoms and aquatic vegetation; basks on sandbars, mud flats, grassy beaches, logs or rocks; eggs are laid near water on sandy beaches or gravel banks in areas with sun; requires acceptable feeding, nesting, habitat and natural, undisturbed corridors between these critical habitats	No	Preferred habitat for this species is not present.

Species at Risk Screening- Upper West Side Block (Project#1974)

Scientific Name	Common Name	S-RANK	SARO	COSEWIC	SARA	SARA Schedule	Background Source	Habitat Preference	Suitable Habitat Present in Upper West Side Block?	Rationale
Reference		MNRF 2019a		Government of Canada 2019			*see below*	OMNR 2000, Oldham and Brinker 2009, Michigan Flora Online 2011, MECP 2019		
Emydoidea blandingii	Blanding's Turtle (Great Lakes / St Lawrence population)	S3	THR	E	T	Schedule 1	SAR in Hamilton Region (MNRF 2019b)	Shallow water marshes, bogs, ponds or swamps, or coves in larger lakes with soft muddy bottoms and aquatic vegetation; basks on logs, stumps or banks; surrounding natural habitat is important in summer as they frequently move from aquatic habitat to terrestrial habitats; hibernates in bogs; not readily observed.	No	Preferred habitat for this species is not present.
Heterodon platirhinos	Eastern Hog-nosed Snake	S3	THR	T	T	Schedule 1	SAR in Hamilton Region (MNRF 2019b)	Sandy upland fields, pastures, savannahs, sandy beaches; dry open oak-pine-maple forest with sandy soils; prefer forest areas > 5ha	No	Preferred habitat for this species is not present.
Pantherophis spiloides pop. 2	Gray Ratsnake (Carolinian population)	S1	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019b)	Shrubby, old field, deciduous or mixed forests, thickets, field edges, rocky hillsides, river bottoms; talus slopes; uses talus slopes, unused wells or cisterns for hibernation; will hibernate in groups with other snakes.	No	Preferred habitat for this species is not present.
Mammals										
Myotis leibii	Eastern Small-footed Myotis	S2S3	END				SAR in Hamilton Region (MNRF 2019b)	Hibernates in cool caves and abandoned mines; roosts in rocky habitats including talus slopes and open rock barrens. May also roost in man-made structures, however, very rarely; foraging habitat poorly understood in Ontario. Within the United States of America, it feeds primarily in forests, but also over waterbodies, within riparian forests, and occasionally open fields.	No	Preferred habitat for this species is not present.
Myotis lucifungus	Little Brown Myotis	S3	END	E	E	Schedule 1	Ontario Mammal Atlas (Dobbyn 1994), SAR in Hamilton Region (MNRF 2019b)	Uses caves, quarries, tunnels, hollow trees or buildings for roosting; winters in humid caves; maternity sites in dark warm areas such as attics and barns; feeds primarily in wetlands, forest edges	Possible	NRSI biologists have documented several candidate roosting trees, and there are buildings on site that could be used as maternity colony roosting habitat.
Myotis septentrionalis	Northern Myotis	S3	END	E	E	Schedule 1	Ontario Mammal Atlas (Dobbyn 1994), SAR in Hamilton Region (MNRF 2019b)	Hibernates during winter in mines or caves; during summer males roost alone and females form maternity colonies of up to 60 adults; roosts in houses, man-made structures but prefers hollow trees or under loose bark; hunts within forest, below canopy	Possible	NRSI biologists have documented several candidate roosting trees, and there are buildings on site that could be used as maternity colony roosting habitat.
Perimyotis subflavus	Tri-colored Bat	S3?	END	E	E	Schedule 1	Ontario Mammal Atlas (Dobbyn 1994), SAR in Hamilton Region (MNRF 2019b)	Variety of forested habitats. Older forests and occasionally in barns or other structures may be used for roosts. They forage over water and along streams in the forest.	Possible	NRSI biologists have documented several candidate oak and maple roosting trees.
Taxidea taxus jacksoni	American Badger (Southwestern Ontario population)	S1	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019b)	Open grasslands and oak savannahs; dens in new hole or enlarged existing hole; sometimes makes food caches	No	Preferred habitat for this species is not present.
Urocyon cinereoargenteus	Gray Fox	S1	THR	T	T	Schedule 1	SAR in Hamilton Region (MNRF 2019b)	Hardwood forests with a mix of fields and woods; swamps; wooded, brushy or rocky habitats; woodland farmland edge; old fields with thickets; dens in hollow log or tree; individual has numerous winter dens throughout its range which is > 40 ha.	No	Preferred habitat for this species is not present.
Insects										
Bombus affinis	Rusty-patched Bumble Bee	S1	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019b)	Open habitat such as mixed farmland, oak savannah, urban settings, and sand dunes.	Possible	Candidate habitat is present in portions of the Upper West Side Block. NRSI biologists will complete targeted insect surveys to determine if the species is present.
Bombus bohemicus	Gypsy Cuckoo Bumble Bee	S1S2	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019b)	Open meadows, agricultural and urban areas, boreal forest and woodlands.	Possible	Candidate habitat is present in portions of the Upper West Side Block. NRSI biologists will complete targeted insect surveys to determine if the species is present.
Coccinella novemnotata	Nine-spotted Lady Beetle	SH	END	E	NS	No Schedule	SAR in Hamilton Region (MNRF 2019b)	Agricultural areas, suburban gardens, parks, coniferous forests, deciduous forests, prairie grasslands, meadows, riparian areas, and isolated natural areas.	Possible, although occurrence on site considered extremely unlikely	Candidate habitat is present in portions of the Upper West Side Block. NRSI biologists will complete targeted insect surveys to determine if the species is present. However, the species is considered possibly extirpated from Ontario, and only historical records exist.
Erynnis martialis	Mottled Duskywing	S2	END	E	NS	No Schedule	SAR in Hamilton Region (MNRF 2019b)	Oak or pine savannas or open woodlands; also non-coastal pine barrens or grassy openings within these communities	No	Preferred habitat for this species is not present.
Freshwater Fishes										
Anguilla rostrata	American Eel	S1?	THR	T	NS	No Schedule	SAR in Hamilton Region (MNRF 2019b)	Starts life in the Sargasso Sea in the North Atlantic Ocean and migrates along the east coast of North America. In Canada, it is found in fresh water and salt water areas that are accessible from the Atlantic Ocean. This area extends from Niagara Falls in the Great Lakes up to the mid-Labrador coast. In Ontario, American Eels can be found as far inland as Algonquin Park. Once the eels mature (10-25 years) they return to the Sargasso Sea to spawn.	No	Preferred habitat for this species is not present.
Moxostoma duquesnei	Black Redhorse	S2	THR	T	T	Schedule 1	SAR in Hamilton Region (MNRF 2019b)	Lives in pools and riffle areas of medium-sized rivers and streams that are usually less than two metres deep. These rivers usually have few aquatic plants, a moderate to fast current, and a sandy or gravel bottom. In the spring, it migrates to breeding habitat where eggs are laid on gravel in fast water. The winter is spent in deeper pools. Adults feed on crustaceans and aquatic insects, while the young fish feed on plankton.	No	Preferred habitat for this species is not present.
Acipenser fulvescens pop. 3	Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)	S2	THR	T	NS	No Schedule	SAR in Hamilton Region (MNRF 2019b)	Freshwater lakes and rivers with soft bottoms of mud, sand or gravel. They are usually found at depths of five to 20 metres. They spawn in relatively shallow, fast-flowing water (usually below waterfalls, rapids, or dams) with gravel and boulders at the bottom.	No	Preferred habitat for this species is not present.
Clinostomus elongatus	Redside Dace	S2	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019b)	Prefers pools and slow-moving sections of relatively small (<10 m width), clear, cool, streams with sand or gravel bottoms , riffle/pool habitat and overhanging vegetation; preferred water temperature range 14-23°C	No	Preferred habitat for this species is not present.

Species at Risk Screening- Upper West Side Block (Project#1974)

Scientific Name	Common Name	S-RANK	SARO	COSEWIC	SARA	SARA Schedule	Background Source	Habitat Preference	Suitable Habitat Present in Upper West Side Block?	Rationale
Reference		MNRF 2019a		Government of Canada 2019			*see below*	OMNR 2000, Oldham and Brinker 2009, Michigan Flora Online 2011, MECP 2019		
Freshwater Molluscs										
Toxolasma parvum	Lilliput	S1	END	E	E	Schedule 1	SAR in Hamilton Region (MNRF 2019b)	Found in a variety of habitats including small to large rivers, wetlands, shallows of lakes, ponds and reservoirs. They are common in soft substrates with over 50% of the substrate type comprised of sand and a mud/muck/silt combination. Typically occur with or near Green Sunfish, Bluegill, White Crappie, and Johnny Darter	No	Preferred habitat for this species is not present.

LEGEND	
SRANK	**COSEWIC**
S1 Critically Imperiled	E Endangered
S2 Imperiled	T Threatened
S3 Vulnerable	NAR Not at Risk
S4 Apparently Secure	N-A Non-Active
SH Possibly Extirpated (Historical)	**SARA**
SARO	E Endangered
END Endangered	T Threatened
THR Threatened	NS No Status
	SARA Schedule
	Schedule 1 Officially Protected Under SARA

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