BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix G

Natural Environment Report and Existing Natural Features Technical Memo

BEACON ENVIRONMENTAL

GUIDING SOLUTIONS IN THE NATURAL ENVIRONMENT

Natural Environment Report

Kennedy Road from Major Mackenzie Drive to Elgin Mills Road Markham, Ontario

Prepared For:

Regional Municipality of York

Prepared By:

Beacon Environmental Limited

Date:	*Project:*
August 2021	**220329**

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1. Introduction

Beacon Environmental Limited (Beacon) has been retained by the Regional Municipality of York ("the Region") to provide a Natural Environment Report (NER) for the future improvements along Kennedy Road from 300 m north of Elgin Mills Road to 300 m south of Major Mackenzie Drive in the City of Markham. This length of Kennedy Road plus 150 m on either side constitutes the study area and the "Subject Lands" in this report (**Figure 1**). Extensive natural heritage investigations have been undertaken within the Subject Lands through the Master Environmental Servicing Plans (MESP) for the Robinson Glen and Angus Glen Block, both of which are part of the Future Urban Area (FUA) in the City of Markham. The results of these investigations have been consolidated within this NER to describe existing conditions. Applicable policies have been compiled and applied to discuss legislative requirements.

2. Applicable Federal and Provincial Legislation

This section of the report provides an overview of key federal, provincial and local environmental policies, legislation, and regulations that are directly relevant to the project.

2.1 Federal

2.1.1 Species at Risk Act (2002)

The federal *Species at Risk Act* (SARA; 2002) is intended to prevent federally endangered or threatened wildlife (including plants) from becoming extinct in the wild, and to help in the recovery of these species. This Act is also intended to help prevent species federally listed as Special Concern from becoming endangered or threatened. To ensure the protection of Species at Risk (SAR), SARA contains prohibitions that make it an offence to kill, harm, harass, capture, take, possess, collect, buy, sell or trade an individual of a species listed in Schedule 1 of SARA as endangered, threatened or extirpated.

SARA applies primarily to lands under federal jurisdiction and relies upon provincial legislation to protect SAR habitat. On private lands, SARA prohibitions only apply to aquatic species and migratory birds listed in the *Migratory Birds Convention Act* (MBCA; 1994).

2.1.2 Federal Fisheries Act (1985)

Fish and fish habitat are protected under the federal *Fisheries Act* (1985) which was last amended on August 28, 2019 and is administered by Fisheries and Oceans Canada (DFO). The protection provisions of the Fisheries Act apply to all fish and fish habitat throughout Canada and the Act sets out authorities for the regulation of works, undertakings or activities that risk harming fish and fish habitat. Specifically, the protection provisions include two core prohibitions. One is against persons carrying on works, undertakings or activities that result in the "death of fish by means other than fishing" (subsection 34.4[1]), and the other is "harmful alteration, disruption or destruction of fish habitat" (subsection 35[1]; also referred to as "HADD"). The protection provisions are applied in conjunction with other applicable federal laws and regulations related to aquatic ecosystems, including the federal SARA.

Fish habitat is defined in subsection 2(1) of the *Fisheries Act* to include all waters frequented by fish and any other areas upon which fish depend directly or indirectly to carry out their life processes. The types of areas that can directly or indirectly support life processes include, but are not limited to, spawning grounds and nursery, rearing, food supply and migration areas.

Under subsection 35(1) a person may carry on such works, undertakings or activities without contravening this prohibition, provided that they are carried on under the authority of one of the exceptions listed in subsection 35(2), and in accordance with the requirements of the appropriate exception. In most cases, this exception would be Ministerial authorizations granted to proponents in accordance with the Authorizations Concerning Fish and Fish Habitat Protection Regulations under the *Fisheries Act*.

Proponents are responsible for planning and implementing works, undertakings or activities in a manner that avoids harmful impacts, specifically the death of fish and HADD. Where proponents believe that their work, undertaking or activity will result in harmful impacts to fish and fish habitat, DFO will work with proponents to assess the risk of their proposed work, undertaking or activity resulting in the death of fish or HADD of fish habitat and provide advice and guidance on how to comply with the *Fisheries Act*.

2.1.3 Migratory Birds Convention Act (1994)

The federal MBCA (1994) protects the nests, eggs and young of most bird species from harassment, harm or destruction. On the site, this legislation would apply in relation to any proposed vegetation clearing as part of the implementation of the proposed site development plan, once approved. Although there are no permitting requirements, proponents must comply with the legislation and may be fined if found to be in contravention of the MBCA.

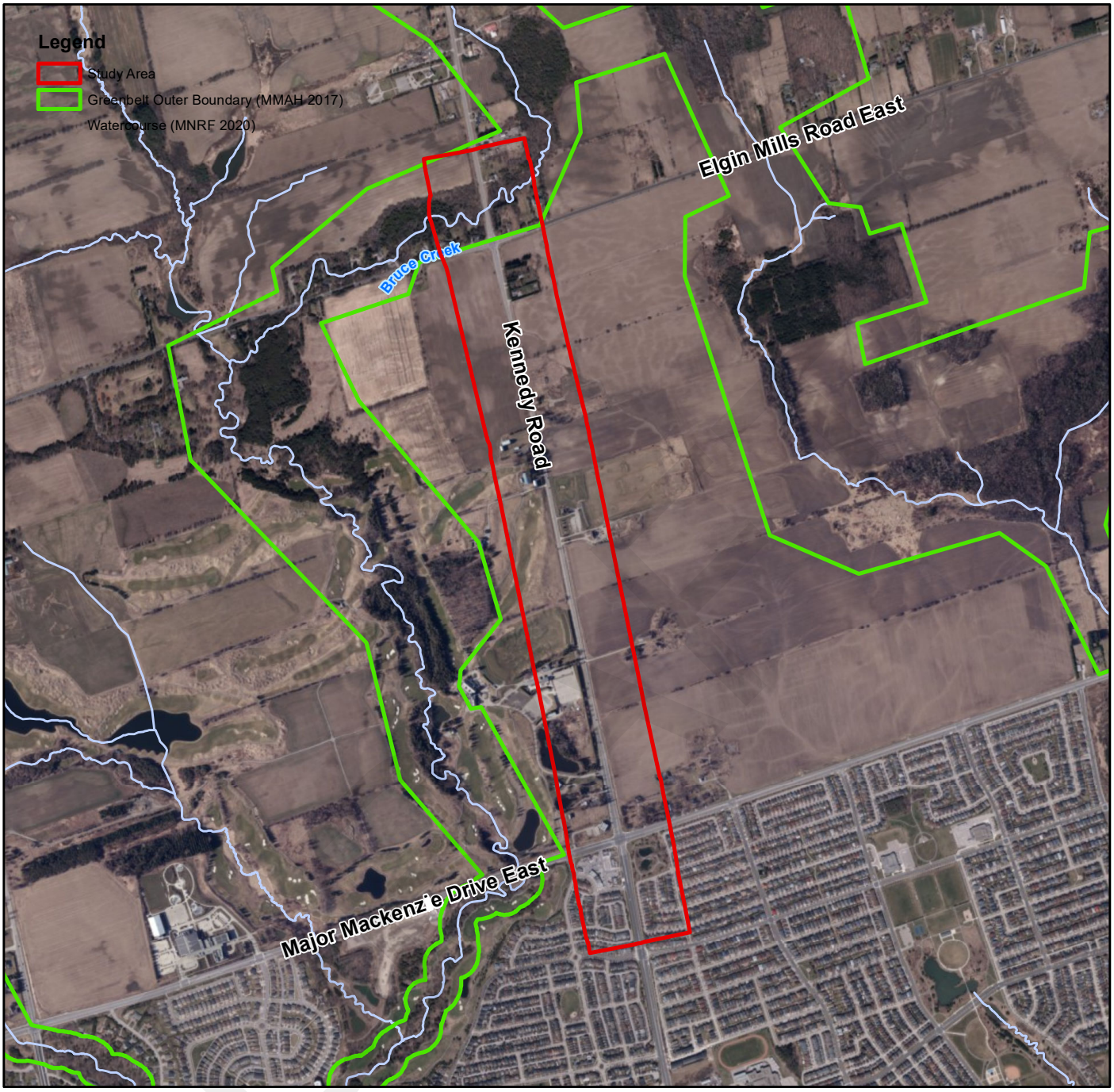
Environment Canada currently considers the “high risk” period for encountering nesting birds in southern Ontario to be from mid-March to late August. Regardless of the date, any nest and the habitat to support the nesting birds is protected under the MBCA, and therefore even for proposed vegetation clearing outside of the “high risk” window, surveys should be conducted by a qualified environmental inspector to screen for active nests prior to works being undertaken.

2.2 Provincial

2.2.1 Endangered Species Act (2007)

SAR in Ontario include species that are listed as endangered, threatened or special concern at the provincial level, however the Endangered Species Act (ESA), implemented by the Ministry of Environment, Conservation and Parks (MECP) regulates only the habitat and individuals of endangered or threatened species. Species listed as special concern are addressed through the Provincial Policy Statement (PPS) and policies pertaining to Significant Wildlife Habitat (SWH). ESA provides legal protection to the habitat of endangered and threatened species where it occurs and where any individuals occur, they are also protected.

The methodology of this NER includes screening for habitat for endangered or threatened species. Relevant sections of the ESA are included below:



Site Location	Figure 1
Kennedy Road Natural Environment Report	
BEACON ENVIRONMENTAL	Project: 220329 Last Revised: June 2021
Client: Regional Municipality of York	Prepared by: BD Checked by: CG
N 1:20,000	Inset Map:1:120,000

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Subsection 9(1) of the ESA states that:

> *No person shall:*
> *a) Kill, harm, harass, capture or take a living member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species;*
> *b) Possess, transport, collect, buy, sell, lease, trade or offer to buy, sell, lease or trade;*
> *a. A living or dead member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species;*
> *b. Any part of a living or dead member of a species referred to in subclause (i);*
> *c. Anything derived from a living or dead member of a species referred to in subclause (i); or*
> *c) Sell, lease, trade or offer to sell, lease or trade anything that the person represents to be a thing described in subclause (b) (i), (ii) or (iii).*

Subsection 10(1)(a) of the ESA states that:

> *No person shall damage or destroy the habitat of a species that is listed on the Species at Risk in Ontario list as an endangered or threatened species.*

However, under subsection 17(1) of the ESA, the Minster may issue a permit that authorizes a person to engage in an activity that would otherwise be prohibited by subsection 9(1) or 10(1) of the ESA provided the applicable legislative requirements of subsection 17(2) are satisfied.

2.2.2 Provincial Policy Statement (2020)

The Provincial Policy Statement (PPS) provides the policy foundation for protection of natural features and areas in Ontario. The Policy states that natural heritage systems should be identified, and the biodiversity and ecological function of those systems should be maintained. Relevant sections of PPS policies for protection of significant features are as follows:

Policy 2.1.4 states that:

> *Development and site alteration shall not be permitted in significant wetlands in Ecoregions 5E, 6E and 7E.*

Policy 2.1.5 states that:

> *Development and site alteration shall not be permitted Significant Wildlife Habitat unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions*.

Policy 2.1.6. states that:

> *Development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements.*

Policy 2.1.8 states that:

> *Development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in policies 2.1.4, 2.1.5, and 2.1.6 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.*

While these policies of the PPS shall be considered, a Class EA process can demonstrate the need for a project that would not otherwise comply with the above.

2.2.3 Greenbelt Plan

Portions of the Subject Lands lie within the Protected Countryside designation of the *Greenbelt Plan* area. Protected Countryside areas are those lands outside of Settlement Areas which are not prime agricultural areas and generally consist of a mixture of agricultural lands, natural features and recreational and historic rural land uses. Portions of the Subject Lands are also located within the Natural Heritage System (NHS) area as defined in Section 3.2 of the *Greenbelt Plan*.

The NHS policies protect areas of natural heritage, hydrologic and/or landform features to support biodiversity and overall ecological integrity. Section 3.2.2.3 of the *Greenbelt Plan* states that:

> *New development or site alteration in the Natural Heritage System (as permitted by the policies of this plan) shall demonstrate that:*
>
> *a. There will be no negative effects on Key Natural Heritage Features (KNHFs) or Key Hydrologic Features (KHFs) or their functions;*
> *b. Connectivity along the system and between KNHFs and KHFs located within 240 m of each other will be maintained or, where possible, enhanced for the movement of native plants and animals across the landscape;*
> *c. The removal of other natural features not identified as KNHFs and KHFs should be avoided. Such features should be incorporated into the planning and design of the proposed use wherever possible; and*
> *d. The disturbed area, including any buildings and structures, of the total developable will not exceed 25 percent, and the impervious surface of total developable area will not exceed 10 percent, except for uses described in and governed by Section 4.1.2 and 4.3.2.*

With some exceptions, the *Greenbelt Plan* prohibits development or site alteration in KNHFs and KHFs within the NHS, including any associated Vegetation Protection Zone (VPZ). In accordance with Section 4.2.3.3, "…naturalized stormwater management systems may be permitted within the VPZ of a significant valleyland, provided they are located a minimum of 30 m from the river or stream, and they are located outside of the VPZ of any KNHFs and KHFs".

The Key Natural Heritage Features and Key Hydrologic Features Policy identified in section 3.2.2.3 of the *Greenbelt Plan* also identifies new development or site alteration in the NHS (as permitted by the policies of this Plan) shall demonstrate that:

> *a. There will be no negative impacts on KNHF or KHF or their functions;*
> *b. Connectivity along the system and between KNHFs or KHFs located within 240 m of each other is maintained or possible;*

- *Enhanced for the movement of native plants and animals across the landscape; and*

c. *The removal of other natural features not identified as KNHF and KHF should be avoided. Such features should be incorporated into the planning and design of the proposed use wherever possible;*
d. *Except for uses described in and governed by the polices of sections 4.1.2 and 4.3.2;*
e. *At least 30 per cent of the total developable area will remain or be returned to natural self-sustaining vegetation, recognizing that section 4.3.2 establishes specific standards for the uses described there.*

Policies outlined in both section 3.2.2 relating to Natural Heritage System Polices and Section 3.2.5 Key Natural Heritage Features and Key Hydrologic Feature polices apply. As such, development or site alteration is not permitted in KHFs and KNHFs within the NHS, including the associated MVPZ with certain exceptions including infrastructure in accordance with Section 4.2.

2.2.4 Regional Municipality of York Official Plan - Office Consolidation (2019)

The regional official plan and associated mapping identifies several policy designations for the areas within the Subject Lands including Urban and Agricultural land use designations. Natural environmental areas associated with Bruce Creek valley crossing of the Subject Lands are designated under the Regional Greenlands System, Greenbelt Plan Boundary, Natural Linkage Area , Provincially Significant and Provincial Plan Area Wetlands and Woodlands.

As part of the planning process for the FUA, MNRF requested that wetland evaluations be completed for wetlands in the Bruce Creek and Berczy Creek subwatershed areas. The outcome of the evaluation process would then be integrated with the City's ongoing planning studies. Riparian wetlands located in the Bruce Creek valley and along its tributary have been identified as part of the Berczy and Bruce Creek Provincially Significant Wetlands Complex as confirmed by the MNRF in February 2017.

Section 2.2.44 of the Plan states:

> *That notwithstanding policy 2.2.4 of this Plan, development and site alteration is prohibited within significant woodlands and their associated vegetation protection zone except as provided for elsewhere within this Plan.*

2.2.45 of the Plan states:

> *That significant woodlands be verified on a site-by-site basis and shall include those woodlands meeting one of the following criteria:*
> *a) is 0.5 hectares or larger and:*
> *i. directly supports globally or provincially rare plants, animals or communities as assigned by the Natural Heritage Information Centre; or,*
> *ii. directly supports threatened or endangered species, with the exception of specimens deemed not requiring protection by the Province (e.g., as is sometimes the case with Butternut); or,*
> *iii. is within 30 metres of a provincially significant wetland or wetland as identified on Map 4, waterbody, permanent stream, or intermittent stream.*

The forest community within the Bruce Creek valley crossing and the Central Woodland Feature on Angus Glen Golf Course Lands (SWD2-2) are designated as Significant Woodlands. The Central

Woodland Feature on Angus Glen Golf Course Lands (SWD2-2) are also designated as a Provincially Significant Wetland (PSW). All woodlands within the Bruce Creek valley meet the test of significance by virtue of their proximity to Redside Dace habitat. The SWD2-2 woodland is considered significant due to PSW status. This feature is also within an Urban Area designation as per Map 1 of the regional official plan and therefore the following section was considered.

Section 2.2.48 of the Plan states:

> *That within the Urban Area or within the existing settlement areas as defined in the Lake Simcoe Protection Plan, and outside of the Oak Ridges Moraine Conservation Plan and Greenbelt Plan areas, a woodland, or portions thereof, which would be defined as significant woodland in accordance with policy 2.2.45 of this Plan, is not considered significant if all of the following are met:* ***a.*** *the woodland is located outside of the Regional Greenlands System as shown on Map 2 of this Plan; b. the woodland is located in an area strategic to the achievement of the community objectives of Section 5.2 and 5.6 of this Plan or is identified within an intensification area detailed in a local municipal intensification strategy, and is evaluated through an official plan amendment process, or other appropriate study; c. the woodland does not meet the criteria in policy 2.2.45.a of this Plan.*

The significant woodlands identified above do not meet any of the conditions above, therefore no exception is applicable to it regarding development and site alteration prohibitions.

The regional official plan also has policies for wetlands protection. Section 2.2.37 of the Plan states:

> *To permit development and site alteration within 120 metres of wetlands identified on Map 4, but not within the vegetation protection zone, subject to an approved environmental impact study that demonstrates no negative impacts to the wetland feature or its ecological functions. Notwithstanding the aforementioned, within the vegetation protection zone, development and site alteration may be permitted in accordance with policies 2.1.10.a and 2.1.10.e of this Plan*

Section 2.1.10e of this Plan states:

> *That notwithstanding policy 2.1.9, within the Regional Greenlands System, the following uses may be permitted subject to meeting the requirements of applicable Provincial Plans: e. new infrastructure required to service the community including water and wastewater systems, and streets if: i. no other reasonable alternative location exists and if an approved environmental impact study demonstrates that it can be constructed without negative impact, and shall be subject to the policies of the Greenbelt Plan, where applicable; or, ii. authorized through an Environmental Assessment.*

2.2.4.1 York Region Tree Bylaw

The Region has Street Tree and Forest Preservation Guidelines (2016), which apply to Region-owned street trees and natural vegetation within the road allowance as well as adjacent to trees located on private properties. Specifically, the Region's guidelines apply to Region-owned trees within 10 m or less of site disturbance proposed within the road allowance and/or Region-owned trees otherwise adversely impacted by site disturbance outside of the road allowance and/or private trees >10 cm diameter at breast height (DBH) within 10 m of site disturbance proposed within the road allowance.

A Tree Inventory has been prepared of all trees (outside of woodlands) within the subject lands, which would encompass all trees for which the guidelines are applicable. Any works that would remove or injure these trees will require permissions from the Region and/or adjacent landowners.

2.2.5 Markham Official Plan (2014)

The City of Markham reinforces that preservation and connectivity of the York Region Greenland System, which provides increased environmental and recreational benefits to the City of Markham and surrounding municipalities. The Subject Lands is located within a Future Neighbourhood Area with smaller areas within a Future Employment Area, existing Residential and Countryside land use designations the land use designation as per Map 3. As identified in Section 2.2.2.2, the Greenway System, Natural Heritage Network (NHN), Rouge Watershed Protection Area (RWPA) and areas of significant woodlands and valleylands are within the Subject Lands.

Policies in Section 3.1 City's Official Plan (2018 Office Consolidation) define elements of the Greenway System and provide direction on the determination of Greenway System boundaries and its protection and management.

Section 3.1.1.11 of this Plan states:

> *To ensure to the extent possible that connectivity is maintained or enhanced between key natural heritage and/or key hydrologic features to accommodate the movement of native plants and animals across the landscape where development, redevelopment and site alteration is proposed in the Greenway System.*

During the EA process, design consideration shall be made that ensures maintaining the connectivity of the Greenway System and allowing movement of amphibians and other small animals.

Section 3.1.1.12 of this Plan states:

> *To discourage the removal of other natural heritage features, including hedgerows and smaller woodlot features not identified as part of the Natural Heritage Network identified in Section 3.1.2.1, where they:*
>
> *a) Provide a linkage to other natural heritage features;*
> *b) Provide for wildlife habitat and movement; or*
> *c) Comprise healthy and mature trees.*

Section 3.1.1.13 of this Plan states:

> *To encourage the incorporation of other natural heritage features referred to in Section 3.1.1.12 into the planning and design of proposed development, wherever possible, and where identified for protection in an environmental impact study.*

Section 3.1.1.16 of this Plan states:

> *To protect and enhance woodlands and significant woodlands, as defined by the Province, the Region, and the City by:*
>
> *a) Prohibiting development, redevelopment and site alteration except:*
> *i. Where infrastructure is provided in accordance with Section 3.1.2.9; or*
> *ii. As provided for in Section 3.1.2.17;*

b) Securing vegetation protection zones in accordance with Section 3.1.2.22; and
c) Seeking public ownership of significant woodlands and woodlands through the development approval process where appropriate, and where this is not appropriate, securing conservation easements and other protection tools for the long-term protection of significant woodlands and woodlands in private ownership.

Section 3.1.2.9 of this Plan states:

That where the need for infrastructure in the Natural Heritage Network is demonstrated and no reasonable alternative is available as identified through an appropriate study and in consultation with the City and appropriate agencies, the impact of the infrastructure shall be minimized and mitigated by:

a) Avoiding natural heritage and hydrologic features, where possible;
b) Avoiding provincially significant wetlands except where addressed through an environmental assessment process;
c) Minimizing the length of crossings through the Natural Heritage Network;
d) Only considering the location of stormwater management facilities in accordance with Section 3.3.3.9;
e) Locating nature-based recreation infrastructure, as described in Section 3.1.1.9, to avoid natural heritage and hydrologic features, where possible;
f) Optimizing existing and planned capacity through coordination and co-location of infrastructure among service providers;
g) Providing appropriate mitigation measures to address the impacts on natural heritage and hydrologic features; and
h) Ensuring compliance with the applicable policies of the Oak Ridges Moraine Conservation Plan and the Greenbelt Plan and consistency with the Provincial Policy Statement.

Furthermore, section 3.1.2.11 of the Plan states that:

To protect and enhance key natural heritage features and key hydrologic features and their functions by:

a) Prohibiting development, redevelopment and site alteration within key natural heritage features and key hydrologic features as determined through an environmental impact study, natural heritage evaluation and/or hydrological evaluation, or equivalent study except as otherwise provided for in the policies of this Plan;
b) Securing vegetation protection zones in accordance with Section 3.1.2.22;
c) Valuating features not identified on Map 5 – Natural Heritage Features and Landforms and Map 6 – Hydrologic Features using procedures developed or applied by the Province, or where determined appropriate by the City in consultation with relevant agencies, an environmental study, to determine if they qualify for protection as key natural heritage features and key hydrologic features; and
d) Working with other governments and agencies to identify and protect:
    a. Habitat of endangered and threatened species, and habitat of special concern species; and
    b. Life Science Areas of Natural and Scientific Interest and providing protection policies consistent with senior government requirements.

Section 3.1.2.19 of the Plan states that:

> *To protect and enhance wetlands including provincially significant wetlands by:*
> *a) Prohibiting development, redevelopment and site alteration except:*
> *a. Where infrastructure is provided in accordance with Section 3.1.2.9; or*
> *b. In wetlands that are not provincially significant wetlands, or identified in the York Region Official Plan, in accordance with Section 3.1.2.20;*
> *b) Securing vegetation protection zones in accordance with Section 3.1.2.22;*
> *c) Integrating wetlands into new communities as appropriate; and*
> *d) Seeking public ownership of wetlands through the development approval process.*

Efforts shall be made during the EA process to avoid, as much as possible, impacts to KNHFs and KHFs. Environmental design and mitigation measures have been recommended to minimize negative impacts on natural heritage. Measures proposed in Section 5 would serve to minimize the impacts on these features.

Finally, regarding the Rouge Watershed Protection Area, Section 3.1.4.1 of the Plan states that:

> *That where development, redevelopment or site alteration is proposed adjacent to a watercourse within the Rouge watershed, the refinement and confirmation of the boundary of the 'Rouge Watershed Protection Area' as shown on Map 4 – Greenway System will be required in accordance with the 'Rouge Watershed Protection Area' objectives contained in Table 3.1.4.1 below and the requirements of the boundary delineation criteria for the 'Rouge Watershed Protection Area' contained in the Rouge North Implementation Manual.*

Environmental design and mitigation measures shall be developed for the Project to minimize negative impacts on natural heritage. Measures proposed to be developed through the EA process shall be compliant with the RWPA objectives.

Section 3.2.1 of the Plan states that:

> *To protect, expand and integrate the urban forest in existing and new communities by:*
> *a) Encouraging the enhancement of a resilient and healthy urban forest by increasing tree canopy coverage and encouraging a diversity of tree species through tree planting and restoration of public lands in appropriate locations;*
> *b) Providing sustainable growing environments for trees by allocating adequate soil volumes and landscaped area through development, redevelopment and site alteration and infrastructure;*
> *c) Reviewing applications for development, redevelopment and site alteration to minimize impacts on the urban forest. Where woodlands or other trees cannot be retained in situ, as supported by appropriate studies in accordance with the policies of this Plan, compensation will be provided in accordance with Council policy and best practices determined as follows:*
> *a. Compensation for woodlands that meet the criteria of Section 3.1.2.17 shall take into consideration the following principles:*
> *i. Achieving no net loss of woodland area, ecological functions including ecological services, and the overall area of the Greenway System;*

ii. *Providing appropriate locations for ecological restoration in Markham with a priority given to Natural Heritage Network Enhancement Lands; providing appropriate implementation mechanisms including cash-in-lieu; and*
iii. *Other considerations deemed appropriate by Council; and*
iv. *Compensation for trees not within significant woodlands or woodlands, shall be applied using tree replacement standards in accordance with City policy and guidelines;*

d) *Regulating the injury of destruction of trees on public and private property through York Region and Markham tree protection by-laws; and*
e) *Increasing awareness of the benefits of the urban forest and promoting education and involvement in the stewardship of Markham's urban forest. (Markham Mod.229).*

As trees within significant woodlands may require removal as part of this project, compensation requirement will be applicable and need to meet the objectives of Section 3.2.1 c) above.

2.2.6 Toronto Region Conservation Authority Policies and Regulation

The *Conservation Authorities Act* (1990) allows for the establishment of Conservation Authorities with the purpose of developing and implementing watershed-based programs for the conservation, restoration, development, and management of natural resources other than oil, gas, coal, and minerals. Conservation Authorities have the power to develop watershed management plans, work with private landowners for conservation projects, implement flood control measures, own and operate Conservation Areas, and create regulations pertaining to water bodies and flooding.

Portions of the Subject Lands are within the jurisdiction of the Toronto Region Conservation Authority (TRCA) therefore, this *Act* applies to the Project. The sections of the Subject Lands located within the Local Greenlands System corresponds to the Bruce Creek bed and buffer zones and is within TRCA Regulated Area.

TRCA permitting process is mandated under Section 28 of the *Conservation Authorities Act*. The regulation currently administered by TRCA is Ontario Regulation 166/06: Development, Interference with Wetlands, and Alterations to Shorelines and Watercourses. A permit is required from TRCA prior to any of the following:

- Development within the Regulated Areas including, stream valley, hazard lands, wetlands, and other areas adjacent to a wetland and associated regulation allowances; and
- Straightening, changing, diverting or interfering in any way with the existing channel of a river, creek, stream.

2.2.6.1 Living City Policies

The Living City Policies (LCP) for Planning and Development in the watersheds of the TRCA was approved by the Authority Board on November 28, 2014.

The LCP establishes the TRCA's Vision, Mission, Strategic Objectives and Principles, as well as policies for advocacy for sustainable communities (e.g., climate change, energy, transportation); environmental planning, including environmental protection and environmental management; and for the

administration of TRCA's development interference with wetlands and alterations to shorelines and watercourses regulation. In implementing this document, the TRCA is guided by its vision which states "Our vision is for a new kind of community, The Living City, where human settlement can flourish forever as part of nature's beauty and diversity."

The LCP provides general policies related to terrestrial resources, water resources, natural features and areas, natural hazards, and potential natural cover and buffers. Section 8.4 provides general policies, and Section 8.9 provides policies specific to infrastructure works. Specifically, Section 8.9.6 states:

> *That development, interference and alterations associated with new, replacement or expanded transportation infrastructure crossing valley and stream corridors may be permitted where it can be demonstrated to the satisfaction of TRCA that:*
>
> *a) There are no upstream or downstream impacts to flooding and erosion;*
> *b) Flood flows can be safely conveyed;*
> *c) The crossing is situated at appropriate locations to avoid hazardous lands;*
> *d) The ecological and hydrological functions of the valley or stream corridor are*
> *e) Maintained by considering the following in accordance with TRCA Standards:*
> *i. The physical characteristics and geomorphic processes of the watercourse;*
> *ii. Aquatic and terrestrial habitat;*
> *iii. Valley or stream corridor form;*
> *iv. Aquatic and terrestrial wildlife passage; and pedestrian passage (e.g. trails).*
> *f) For road widenings, the surface area of both the adjacent existing road and the new section of road meet TRCA stormwater management criteria, in accordance with the policies in Section 8.9 for stormwater management.*

Further, TRCA has a "Crossings Guideline for Valley and Stream Corridors" (2015) which outlines TRCA's study requirements and recommendations for the planning and design of valley and stream corridor crossings and should be consulted in design of future watercourse crossings.

3. Existing Conditions

3.1 Methodology

The characterization of existing Subwatershed conditions for the Angus Glen Block and Robinson Glen Block were completed as part of the Phase 1 Subwatershed (SWS) Report (AMECFW 2015) at a level of detail typical of MESP documents. Numerous environmental studies were completed by landowners and other owners that provided input into the SWS. This work was verified and augmented, where required, by the AMECFW SWS study team. Hence, the findings of the Phase 1 SWS Report provide a substantial amount of existing conditions characterization presented within the MESP's. Additional fieldwork was completed in 2016/2017 by the MESP study team to augment existing data in a few areas within the Angus Glen Block and Robinson Glen Block. This was undertaken following completion of a gap analysis to determine if any gaps existed in the data to adequately characterize the Angus Glen Block and Robinson Glen Block. The "gap analysis" documented the background reports reviewed and summarizes the nature and timing of collection of data available and appropriate for MESP

characterization of existing conditions. As noted in this report, the MESP team reviewed all available data and concluded that the range of data collected (type, quantity, and location), and the methodologies used are appropriate for MESP characterization of existing conditions on the Angus Glen Block and Robinson Glen Block.

3.1.1 Background Review

Background information regarding the physical and natural setting of the Angus Glen Block and Robinson Glen Block were provided by the following sources:

- Berczy, Bruce, Eckardt and Robinson Creeks SWSs Terms of Reference (AMEC 2014);
- Berczy, Bruce, Eckardt and Robinson Creeks Subwatershed Study – Final Reports (Phases 1, 2 and 3), prepared by AMEC Foster Wheeler SWS Study Team (2019);
- North Markham Future Urban Area Berczy, Bruce, Eckardt, and Robinson Creeks, City of Markham, Phase 2 Subwatershed Impact Assessment (First Iteration) (AMECFW 2016);
- North Markham Future Urban Area Berczy, Bruce, Eckardt, and Robinson Creeks, City of Markham, Phase 2 Subwatershed Impact Assessment (Second Iteration) (AMECFW 2017);
- City of Markham Official Plan Office Consolidation (2014);
- Future Urban Area Conceptual Master Plan, Volume 1: Community Structure Plan and Key Policy Direction (2017);
- Gap Analysis, Existing Environmental Conditions, Berczy Glen, Future Urban Area, City of Markham (Beacon Environmental Limited, R. J. Burnside & Associates Limited, SCS Consulting Group Inc. and Stonybrook Consulting Inc., 2017);
- Berczy Glen Master Environmental Servicing Plan (Berczy Glen MESP), prepared by Stonybrook Consulting *et al*. (2020); and
- Angus Glen Master Environmental Servicing Plan Angus Glen MESP), prepared by SKA, *et al*. (2020).

Additionally, the characterization of existing conditions provided in this report, included a desktop review and search of applicable databases followed by one field reconnaissance to confirm exiting conditions within the Subject Lands and to fill in or identify any data gaps identified upon review of the above listed documents.

3.1.2 Field Investigations

Field investigation completed for the Angus Glen MESP were primarily completed in 2015 to 2016, with some additional investigations completed in 2017. Field investigation completed for the Robinson Glen MESP were primarily completed in 2008 to 2015, with some additional investigations completed in 2019 as well. In 2021 field reconnaissance, ELC mapping and an assessment of general watercourse conditions was completed for the areas within the Subject Lands that were outside of the Angus Glen Block and Robinson Glen Block scope, primarily 300 m south of the Kennedy Road and Major Mackenzie Drive intersection, 300 m north of the Kennedy Road and Elgin Mills Road East intersection including the Bruce Creek crossing of Kennedy Road and its associated corridor.

West Side of Kennedy Road (Angus Glen Block):

- Breeding birds were surveyed in spring 2013 within the majority of the Angus Glen Block. Additionally, third visits were conducted in 2013, specifically to survey for the presence of

Bobolink (*Dolichonyx oryzivorus*) and Eastern Meadowlark (*Sturnella magna*) in suitable habitat and to survey suitable buildings for the nests of Barn Swallows (*Hirundo rustica*);
- HDFA investigations were undertaken within the block from spring/ summer 2014 to 2015;
- Aquatic habitat assessments on the Bruce Creek, were completed in spring/ summer 2013; and
- Breeding amphibian surveys were undertaken during the evenings after dusk in spring 2013. To complete a full season of amphibian surveys, three rounds of call count surveys were conducted in spring 2017.

East Side of Kennedy Road (Robinson Glen Block):

- Terrestrial resources were investigated within the Robinson Glen Block at various locations from 2008 through to 2019;
- Breeding birds were most recently surveyed on multiple occasions in June 2013, June/ July 2014 and on multiple occasions in June 2015;
- Amphibian call count surveys were conducted on the Subject Lands in 2008, 2009, 2010, 2011, and 2014, following the Marsh Monitoring Program (MMP) methodology (Bird Studies Canada 2009);
- Aquatic habitat assessments and fish community sampling was completed on all aquatic feature within the within the Robinson Glen Block in the summer (July / August) of 2009 and again at some more sensitive feature, in summer (July / August) 2014/ 2015; and
- HDFA investigations were undertaken within the Robinson Glen Block in spring (April/May) 2014.

3.1.2.1 Aquatic Habitat Assessment

Fish habitat assessments were completed, within the main branch of Bruce Creek and Robinson Creek, to identify and assess the characteristics of the permanent features that may provide habitat for the critical life processes, as outlined in the federal *Fisheries Act*. The habitat assessments detail the characteristics and major physical attributes of the waterbodies. The habitat assessment takes into consideration a variety of details including both flow characteristics and land influences, such as:

- Surrounding land use – classifies potential pollution sources and adjacent land use that may affect the water body;
- Riparian zone and canopy cover – a healthy riparian zone consists of vegetation characterized by trees, shrubs, grasses and herbaceous plants. These plants help buffer the water body from runoff, provide shade and create habitat for fish and insects;
- Stream banks – characteristics assessed include signs of erosion and bank scouring, undercut banks, evidence of the normal water mark and high-water mark (HWM) which indicate the water level fluctuation;
- In-stream characteristics – details include substrate type (e.g., silt, gravel, cobble), aquatic vegetation, small and large woody debris. These in-stream characteristics provide habitat and cover for fish species and benthic macroinvertebrates, which are an important food source for fish;
- Stream morphology – this includes the wetted width of the active channel and average wetted depth as well as a description of the stream morphology:
    - Runs - typically deep, fast moving water with little to no turbulence;
    - Riffles – shallow, fast moving water typically running over rocks. Riffles provide areas of highly oxygenated water;

    - Flats – low flowing water with a smooth un-agitated surface;
    - Pools – deep pockets of slow-moving water that provide ideal refuge habitat for fish; and
- General water characteristics – water colour and clarity, presence and description of algae, and description of flow.

The Rouge River Watershed Fisheries Management Plan (TRCA and MNRF draft 2011) and Lands Information Ontario (LIO 2021) was referenced to identify the fish community within the Bruce Creek and Robinson Creek Subwatershed.

3.1.2.2 Headwater Drainage Feature Assessment

As part of the SWS, HDF data was collected according to the *Ontario Stream Assessment Protocol Headwater Drainage Feature Module* (Stanfield *et al*., 2013), scoped for data relevance and adapted to a reach-based approach. The features were classified according to the *Evaluation, Classification and Management of Headwater Drainage Features Guidelines* (TRCA and CVC 2013). TRCA provided ArcHydro mapping and the digital elevation model that identified where HDFs were likely to be present. This linework was used as a basis for the assessment of the HDF as well as air photo interpretation.

The guidelines use an integrated approach to the evaluation of key attributes of drainage features including flow and feature form (combined under the term hydrology), riparian vegetation, fish and fish habitat and terrestrial habitat. The evaluation divides headwater drainage features into segments, with breaks between segments occurring where key attributes change. Each segment is assigned a rating of its functional significance of important, valued, contributing, or limited. The functional significance of all attributes of each segment is then considered to determine the recommended management option for each segment. These evaluations can lead to one of six possible management recommendations – Protection, Conservation, Mitigation, Recharge Protection, Maintain or Replicate Terrestrial Linkage and No Management.

The management recommendations are taken directly from the TRCA HDF Assessment protocol and are summarized as follows:

Protection – Important Functions: e.g., swamps with amphibian breeding habitat; perennial headwater drainage features; seeps and springs; SAR habitat; permanent fish habitat with woody riparian cover

Protect and/or enhance the existing feature and its riparian zone corridor, and groundwater discharge or wetland *in-situ*;

- Maintain hydroperiod;
- Incorporate shallow groundwater and base flow protection techniques such as infiltration treatment;
- Use natural channel design techniques or wetland design to restore and enhance existing habitat features, if necessary; realignment not generally permitted; and
- Design and locate the stormwater management system (e.g., extended detention outfalls) are to be designed and located to avoid impacts (i.e. sediment, temperature) to the feature.

Conservation – Valued Functions: e.g., seasonal fish habitat; with woody riparian cover; marshes with amphibian breeding habitat; or general amphibian habitat with woody riparian cover:

- Maintain, relocate, and/or enhance drainage feature and its riparian zone corridor;
- If catchment drainage has been previously removed or will be removed due to diversion of stormwater flows, restore lost functions through enhanced lot level controls (i.e., restore original catchment using clean roof drainage), as feasible;
- Maintain or replace on-site flows using mitigation measures and/or wetland creation, if necessary;
- Maintain or replace external flows;
- Use natural channel design techniques to maintain or enhance overall productivity of the reach; and
- Drainage feature must connect to downstream.

Mitigation – Contributing Functions: e.g., contributing fish habitat with meadow vegetation or limited cover:

- Replicate or enhance functions through enhanced lot level conveyance measures, such as well vegetated swales (herbaceous, shrub and tree material) to mimic online wet vegetation pockets, or replicate through constructed wetland features connected to downstream;
- Replicate on-site flow and outlet flows at the top end of system to maintain feature functions with vegetated swales, bioswales, etc. If catchment drainage has been previously removed due to diversion of stormwater flows, restore lost functions through enhanced lot level controls (i.e., restore original catchment using clean roof drainage); and
- Replicate functions by lot level conveyance measures (e.g., vegetated swales) connected to the natural heritage system, as feasible and/or Low Impact Development (LID) stormwater options (refer to Conservation Authority Water Management Guidelines for details).

Recharge Protection – Recharge Functions: e.g., features with no flow with sandy or gravelly soils:

- Maintain overall water balance by providing mitigation measures to infiltrate clean stormwater, unless the area qualifies as an Area of High Aquifer Vulnerability under the *Oak Ridges Moraine Conservation Plan* (ORMCP) or Significant Recharge Areas under the *Source Water Protection Act*. These areas will be subject to specific policies under their respective legislation; and
- Terrestrial features may need to be assessed separately through an Environmental Impact Study to determine whether there are other terrestrial functions associated with them.

Maintain or Replicate Terrestrial Linkage – Terrestrial Functions: e.g., features with no flow with woody riparian vegetation and connects two other natural features identified for protection:

- Maintain the corridor between the other features through in-situ protection or if the other features require protection, replicate, and enhance the corridor elsewhere; and
- If the feature is wider than 20 m, it may need to be assessed separately through an Environmental Impact Study to determine whether there are other terrestrial functions associated with it.

No Management Required – Limited Functions: e.g., features with no or minimal flow; cropped land or no riparian vegetation; no fish or fish habitat; and no amphibian habitat:

- The feature that was identified during desktop pre-screening has been field verified to confirm that no feature and/or functions associated with headwater drainage features are present on the ground and/or there is no connection downstream. These features are

generally characterized by lack of flow, evidence of cultivation, furrowing, presence of a seasonal crop, and lack of natural vegetation. No management recommendations required.

3.1.2.3 Vegetation Communities

Vegetation community descriptions were based on the Ecological Land Classification (ELC) for Southern Ontario (Lee *et al*., 1998). The ELC system is a nested classification that groups Vegetation Types into Ecosites with common soil and generalized vegetation characteristics. Ecosites are grouped into Community Series by type of plant form or landform (e.g., deciduous forest), which in turn are grouped at the Community Class level according to more inclusive categories of plant form or landform such as forest or rock barren. Information included in this system includes dominant species cover, community structure, as well as level of disturbance, presence of indicator species, and other notable features. A floral inventory was conducted in conjunction with the ELC characterization.

3.1.2.4 Breeding Birds

Breeding birds were surveyed within the Angus Glen MESP, this included species specific surveys for the presence of Bobolink and Eastern Meadowlark in suitable habitat and to survey suitable buildings for the nests of Barn Swallows. These three species are considered Threatened in Ontario.

MNRF has established special guidelines for the survey of Bobolink which require a third visit to areas of potential habitat. The additional surveys for Bobolink and Eastern Meadowlark were conducted to be consistent with this protocol. Surveys for nesting Barn Swallow were conducted at all buildings that might contain Barn Swallow nests were inspected internally and externally. A nest was considered active if there were droppings under the nest, adults were seen at the nest, or young were seen in the nest.

Breeding birds were surveyed between 05:30 and 10:30 hrs, with the Barn Swallow nest surveys continuing to 13:30 hrs, on days with low to moderate winds (1-3 Beaufort Scale), temperatures within 5 ºC of normal, and no precipitation.

The Angus Glen Block and Robinson Glen Block were walked such that all singing birds could be heard or observed and recorded. That is, the surveyor is within 50 m - 100 m of all parts of the site depending on habitat. All birds heard and seen were recorded in the location observed on an aerial photograph of the site.

3.1.2.5 Breeding Amphibians

Breeding amphibian surveys were undertaken during the evenings after dusk on the dates noted below. The surveys were conducted during suitable temperature conditions to listen for calling males. Amphibian breeding surveys were completed following the Environment Canada's Marsh Monitoring Program protocol (Gartshore *et al*. 2004). The survey dates were spread out to record different amphibian species that call during different times in the spring. These surveys were conducted to record the presence or absence of breeding amphibians from potentially suitable habitat. Species, calling locations and approximate numbers of calling individuals were recorded and mapped. The survey method provides an indication of amphibian abundance during the breeding season utilizing the following scale:

0. No calls;
1. Individuals of one species can be counted, calls not simultaneous;
2. Some calls of one species simultaneous, numbers can be reliably estimated; and
3. Full chorus calls continuous and overlapping (not countable).

All areas that contained potential breeding amphibian habitat (ponds, wetlands, etc.) were surveyed from a distance that would enable calling amphibians to be heard.

3.1.2.6 Potential Bat Habitat

There are likely trees suitable for bat maternity- and day- roosting located within the study area and a detailed habitat inventory will be completed in later phases of the planning process at the locations that may experience impacts should tree removals be required for the proposed works. These areas are identified in section 4.2.4 below.

3.2 Results

3.2.1 Aquatic Resources

The aquatic features within the Subject Lands are primarily within the Bruce Creek subwatershed, with several small HDFs that drain into Robinson Creek subwatersheds (**Figure 2**). All subwatersheds are within the larger Rouge River watershed boundary and under the jurisdiction of the TRCA. Bruce Creek enters the Subject Lands from the northeast, crossing under Kennedy Road then continuing approximately 230 m west out of the Subject Lands.

The main Bruce Creek is an open watercourse and is completely contained within a well-defined riverine system that is largely west of the Subject Lands, with the exception of the Bruce Creek corridor north of Elgin Mills Road. This section of subwatershed receives external drainage from north of Elgin Mills Road with a contributing drainage area that extends as far north as Bloomington Sideroad in the Town of Whitchurch Stouffville. There are several smaller ponds on the Angus Glen Golf Course Lands (partially within the Subject Lands) that are used for irrigation, including a pond located on the east side of the property south of the parking lot of the clubhouse that overflows to a series of three ponds, before overtopping into Bruce Creek. The lands within the Subject Lands are dominated by agricultural practice and golf course uses. The golf course contains a drainage system made up of a localized drainage network which conveys excess surface runoff to either an outlet to Bruce Creek or an on-site irrigation pond.

Bruce Creek is divided into two areas based on the degree of urbanization and the need for retrofits versus more natural habitat within a rural setting. The dividing line generally corresponds with Major Mackenzie. The northern portion of this zone is still largely rural with patches of natural habitats and still supports healthy populations of Redside Dace and Brook Trout (*Salvelinus fontinalis*). While some development is anticipated over the coming years, the most immediate concern for the aquatic ecosystem in this area of the subwatershed is in-stream barriers that fragment habitat and populations.

Kennedy Road Crossing of Bruce Creek (BR1-1b):

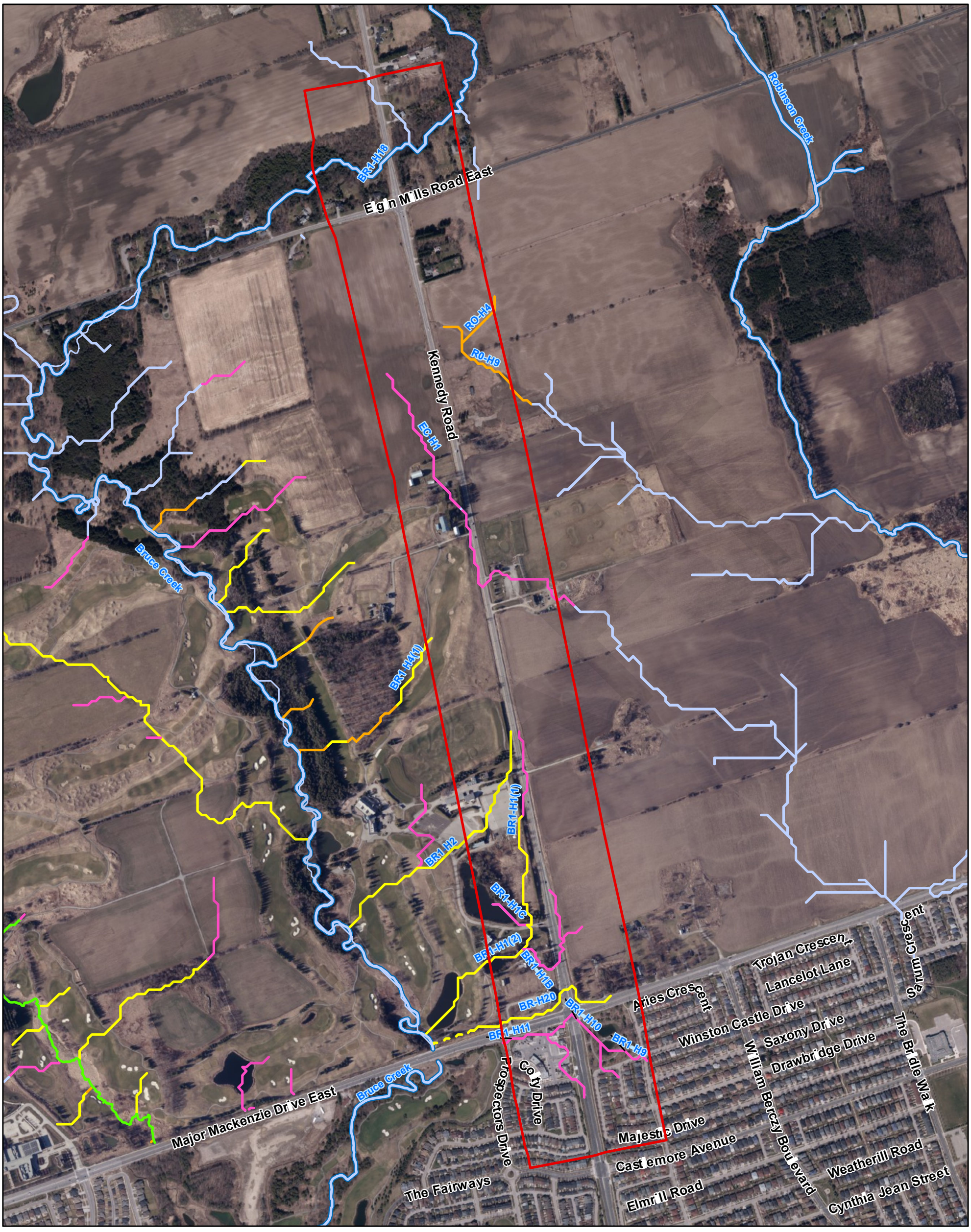
Reach BR1-1b was characterized as a well-defined, sinuous channel flowing through a confined valley setting. Riparian vegetation consisted of trees, grasses and herbaceous plants. Riffle substrate consisted predominantly of gravel and cobble, while pool substrate consisted of sand, gravel and cobble with areas of exposed underlying clay till. Within the ROW, bankfull dimensions ranged 5.3-7.2 m in width and 0.40-1.40 m in depth. Existing channel disturbances included the Kennedy Road crossing. Channel morphology was influenced locally by the road crossing and presence of instream wood debris.

3.2.1.1 Headwater Drainage Features

Management recommendations for the FUA HDFs were addressed in the SWS Phase 1 and 2 analyses. Assessments were initially reported in the Phase 1 Characterization Report (2015) and further reviewed and revised, where required, through the Phase 2 reports and Agency consultation. The SWS Phase 1 Characterization Report provided recommendations, including those HDFs where the recommendations for "No Management" were made. Within the Subject Lands a total of ten features in the Bruce Creek Subcatchment, two features in the Robinson Creek Subcatchment (**Figure 2**). Most appear to be fed by tile drain outlets from the adjacent golf course and agricultural fields. Note that H18 is the upper reaches of Bruce Creek (**see Figure 2**).

Table 1. Headwater Drainage Feature Summary

ID	Feature Description	Flow Regime	HDF Assessment
BR1-H1(1)/ H1(2)	Series of ponds connected by pipes, eventually discharging to Bruce Creek.	Ephemeral	Mitigation (downstream of Kennedy crossing)
BR1-H1B/ H1C	No Management		
BR1-H2	Tile or pipe beneath golf course.	Ephemeral	Mitigation
BR1-H4(1)	Tile or pipe beneath golf course.	Ephemeral	Mitigation
BR1-H9	No Management		
BR1-H10			
BR1-H11			
EC-H1			
BR1-H20	Roadside ditch that conveys flows to Bruce Creek	Ephemeral	Mitigation
RO-H9	Field tile discharging water with no surface feature connecting to Robinson Creek.	Perennial	Conservation
RO-H4	Field tile discharging water with no surface feature connecting to RO1-H9	Perennial	Conservation



Legend

Subject Lands

Headwater Drainage Features Assessment

- Unclassified
- Conservation
- Mitigation
- No Management Required
- Protection
- Maintain / Replicate Terrestrial Linkage
- Watercourse (MNRF 2019)

Thermal Regime

- Cold

Aquatic Existing Conditions | **Figure 2**

Kennedy Road Natural Environmental Report

BEACON ENVIRONMENTAL

Project: 220329
Last Revised: August 2021

Client: Regional Municipality of York

Prepared by: BD
Checked by: CG

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3.2.1.2 Fish Community

Existing fisheries information for Bruce Creek was obtained from the Rouge River Watershed Fisheries Management Plan (TRCA and MNR draft 2011). The Bruce Creek sub-watershed is in Fisheries Management Zone 3 (FMZ 3). Fish community sampling was undertaken in Bruce Creek in coordination with the SWS team and MNRF.

Most of the fish species located within Bruce Creek system are a mix of warmwater, coolwater and coldwater species. Most of the species identified in the Subject Lands are provincially ranked as S5 indicating that each species is secure, widespread, and common within Ontario. Six of the species are ranked as S4 meaning they are common and apparently secure in Ontario; usually with more than 100 occurrences in the province. Bruce Creek is designated as occupied Redside Dace.

Bruce Creek provides habitat for 25 fish species within or close to the north Markham FUA (AMEC 2015). An additional 10 have been captured elsewhere in the Bruce Creek subwatershed. As detailed in the Fisheries Management Plan, the target species for Bruce Creek include Reside Dace, American Brook Lamprey (*Lampetra lamotte*), Rainbow Darter (*Etheostoma caeruleum),* Mottled Scuplin (*Cottus bairdii*), Brook Trout and Rainbow Trout (*Oncorhynchus mykiss*).

American Brook Lamprey can be found in gravel and sand dominated riffles and runs of small to medium sized streams. They prefer clear waters and strong flows. American Brook Lamprey are coldwater species with a preferred temperature range of 9-12°C (Eakins 2017). This species was caught in the main branch of Bruce Creek in 2014 within the Angus Glen Subject Lands. The American Brook Lamprey is ranked as S3 which indicates that this species is rare to uncommon in Ontario; usually between 20 and 100 occurrences in the province; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.

The Rainbow Darter is a coolwater species with a preferred water temperature of 19.8°C (Eakins 2017). The Rainbow Darter prefers fast flowing streams with gravel and cobble bottoms. Bruce Creek within the Subject Lands currently may provide suitable habitat for the Rainbow Darter. The Mottled Sculpin is typically present in streams with cobble and gravel riffles with a temperatures range of 13-18°C (Eakins 2017). Mottled Sculpin, another coldwater species that has only rarely been captured within or close to the north Markham FUA but is more common in the headwaters (AMEC 2015), therefore there may be suitable habitat present in Bruce Creek. Brook Trout are a coldwater fish native to Ontario. Brook Trout prefer streams with abundant cover from overhanging vegetation, logs and rocks in streams. Brook Trout have been identified in some of the headwaters of Bruce Creek (AMEC 2015). Rainbow Trout are a coldwater species with a preferred temperature range of 12-18°C (Eakins 2017). They are typically found in creeks and rivers with moderate flow throughout the Great Lakes and their tributaries. Rainbow Trout are stocked in Bruce Creek upstream of the Angus Glen Subject Lands and likely move throughout the system insofar as barriers permit passage. Bruce Creek is identified by MNRF as Redside Dace occupied habitat with records as recent as 2009.

Land Information Ontario (MNRF 2020) provides a general fish community assemblage for Bruce Creek (AU-0009-ROU); Blacknose Dace (*Rhinichthys atratulus*), Common Shiner (*Luxilus cornutus*), Creek Chub (*Semotilus atromaculatus*), Iowa Darter (*Etheostoma exile*), Johnny Darter (*Etheostoma nigrum*), Longnose Dace (*Rhinichthys cataractae*), Rainbow Darter, Rainbow Trout and White Sucker (*Catostomus commersonii*).

3.2.2 Terrestrial Resources

3.2.2.1 Vegetation Communities

ELC vegetation communities are illustrated on **Figure 3**. In addition to the ELC communities, other communities/land uses not defined by ELC were identified on the within the Subject Lands. These include agricultural lands as well as agricultural operations and single-family dwellings with associated manicured lawns and gardens.

The following paragraphs provide a description of the ELC communities, including some of the dominant plant species and a description of some of the other tree and plant species present.

Cultural Meadow (CUM1)

Small meadow communities are scattered throughout the Subject Lands. They are composed of Tall Goldenrod (*Solidago altissima var. altissima*), Awnless Brome (*Bromus inermis ssp. inermis*), Kentucky Bluegrass (Poa pratensis ssp. pratensis), Wild Carrot (Daucus carota), White Heath Aster (*Symphyotrichum ericoides var. ericoides*), New England Aster (*Symphyotrichum novae-angliae*), and Common Milkweed (*Asclepias syriaca*).

Open Aquatic (OAO)

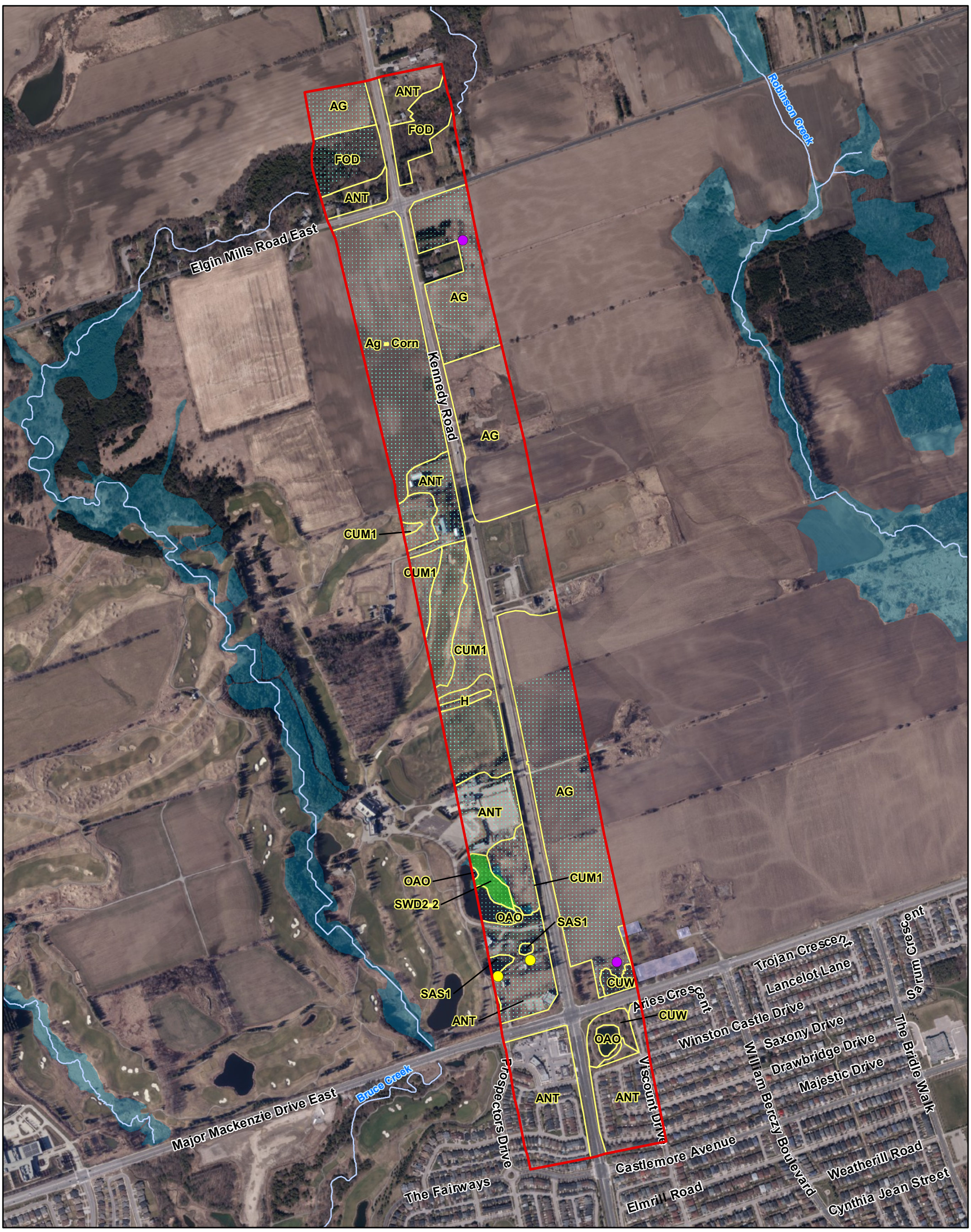
There is one large deep (>2m) irrigation pond directly south of the Angus Glen Club House on the west side of Kennedy Road. A small portion of one pond is within the Subject Lands. The pond is man made, excavated feature that is dominated by open water with some submerged aquatic vegetation near the edges. Common Reed, Reed-canary Grass and Narrow-leaved Cattail occur along the edges of the ponds.

Green Ash Mineral Deciduous Swamp (SWD2-2)

This community occurs in one small area within the golf course on west side of Kennedy Road adjacent to a dug pond. The community consists of 40 to 60% Green Ash with a diverse and variable tree association, and semi-closed canopy (60 to 90% closed). Associate species include Balsam Poplar (*Populus balsamifera*), Trembling Aspen (*P. tremuloides*), American Elm (*Ulmus americana*), Bur Oak (*Quercus macrocarpa*), and White Spruce. Organic soil depths varied between 10 and 30 cm. Wetland herbaceous species include Reed Canary Grass and Spotted Jewelweed. This community is a PSW, as well as a significant woodland.

Submergent Shallow Aquatic (SAS1)

There is one small shallow (<2m) open water dug ponds within the Subjects Lands which are dominated by submerged aquatic vegetation. Common Reed (*Phragmites australis*) and Narrow-leaved Cattail (*Typha angustifolia*) occur around the edges of these man-made features, which have been excavated and some have had berms built around them to hold the water. Many of them contain water features and pumps as they are used for irrigation.



Legend

- Subject Lands
- ELC Communities (Beacon/Savanta Inc./NRSI)
- Area of Breeding Bird Survey
- Significant Woodland
- Watercourse
- Provincially Significant Wetland (MNRF 2020)
- Amphibian Survey Locations
- Wildlife Stations (Beacon/Savanta Inc.)

Code	Wetland Communities
OAO	Open Aquatic
SAS1	Submerged Shallow Aquatic
	Forest Communities
FOD	Deciduous Forest
	Cultural Communities
CUW	Cultural Woodland
CUM1	Mineral Cultural Meadow
	Other Communities
H	Hedgerow
ANT	Anthropogenic
AG	Agricultural
Ag-Corn	Agricultural - Corn Crop

Terrestrial Existing Conditions

Figure 3

Kennedy Road Natural Environmental Report

BEACON ENVIRONMENTAL

Project: 220329
Last Revised: June 2021

Client: Regional Municipality of York

Prepared by: BD
Checked by: CG

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Mineral Cultural Woodland (CUW1)

This woodland feature is found at northeast corner of Major Mackenzie Drive East and Kennedy Road intersection within the Subject Lands. There is another small CUW community, that was assessed from aerial and roadside investigations, that surrounds the small ponds (OAO) at the southeast corner of the Major Mackenzie Drive East and Kennedy Road intersection. The community has a relatively open canopy of mid-aged Silver Maple (*Acer saccharinum*), with occurrences of Eastern White Cedar, Sugar Maple (*A. saccharum*), White Pine (*Pinus strobus*), Black Cherry (*Prunus serotina*), Black Walnut (*Juglans nigra*), and Trembling Aspen (*Populus tremuloides*). Shrubs include Common Lilac (*Syringa vulgaris*), Choke Cherry (*Prunus virginiana*), Nannyberry (*Viburnum lentago*) and Common Buckthorn. The ground flora is dense with vines including Thicket Creeper (*Parthenocissus vitacea*) and Riverbank Grape (*Vitis riparia*) as well as herbs such as Enchanter's Nightshade (*Circaea lutetiana*), Avens (*Geum* spp), and Spotted Jewelweed (*Impatiens capensis*).

Dry - Fresh Deciduous Forest (FOD)

This forest community is associated with the Bruce Creek valley crossing of north of the Kennedy Road and Elgin Mills Road East intersection and was assessed from aerial and roadside investigations.

3.2.2.2 Tableland Trees

A Tree Inventory has been prepared which details all individual trees (i.e., not within significant woodlands) within the Subject Lands (**Appendix A)**.

One Butternut was identified within the Subject Land boundaries within the ANT community surrounding one of the small irrigation ponds. This treed showed signs of canker however, appeared to be in relatively good health. The location of the Butternut is shown in **Figure 4**.

3.2.2.3 Amphibians

Surveys completed in the Angus Glen Block identified a total of four species; American Toad (*Anaxyrus americanus*), Green Frog (*Lithobates clamitans*), Grey Treefrog (*Hyla versicolor*) and Bullfrog (*L. catesbeiana*). Surveys completed within the Robinson Glen Block identified a total of six species; American Toad, Bullfrog, Gray Treefrog, Green Frog, Northern Leopard Frog (*L. pipiens*), and Wood Frog (*L. sylvatica*). All species observed are widespread and common in Ontario. However, the Gray Treefrog and Bullfrog may be less tolerant of disturbance (they are considered L2 and L1 by the TRCA).

Gray Treefrog also requires adjacent woody vegetation for summer habitat and perhaps as hibernating sites. Bullfrogs, which require large permanent waterbodies to breed but may spend part of the summer in smaller ponds, are usually found in water along a well-vegetated shoreline. Green Frog are mostly aquatic, rely on deeper permanent waters, and may be found in relatively poor-quality water. American Toads are habitat generalists, and they will use a variety of wetland or pond types for both breeding and summering. Northern leopard frogs are habitat generalists. They are often found considerable distances from open water. These frogs hibernate on the bottom of waterbodies that do not freeze solid, in many areas in different ponds from those in which they breed. The Wood Frog is most associated with moist woodlands and vernal woodland pools. When inactive, this frog hides in logs, humus and leaf litter or under logs and rocks and hibernates under logs or leaf litter on the forest floor.

3.2.2.4 Breeding Birds

Landbirds prefer different types of habitat and can be grouped into two main categories: forest birds and open country birds. Forests are found within the Subject Lands (primarily within the Bruce Creek valley crossing) and may provide habitat for those species that prefer to nest in forests, including those that require interior forest habitat (i.e., forest at least 100 m from the forest edge). Open country bird species prefer grasslands and meadows, which may be replicated in low intensity pastureland and hay fields. This habitat type is not available within the Subject Lands in large quantities, as the agricultural fields are planted in row crops (either corn or soy), which do not provide breeding habitat for open country species.

There were 59 species of birds were recorded within the Angus Glen Subject Lands, 52 of which were breeding or suspected to be breeding. There were 52 species of birds were observed within Robinson Glen block during the surveys. Of the birds observed, most showed some evidence of breeding.

According to OBBA records (BSC *et al*. 2008), seven SAR birds were identified within the vicinity of the Angus Glen and the Robinson Glen Blocks: Barn Swallow, Bank Swallow (*Riparia riparia*), Bobolink, Chimney swift (*Chaetura pelagic*), Eastern Meadowlark, Wood Thrush (*Hylocichla mustelina*) and Eastern Wood-pewee (*Contopus virens*). Of these species, three SAR birds were observed within the Robinson Glen Block: Barn Swallow, Bobolink, and Wood Thrush which are discussed in more detail below. Of the identified SAR species, five were observed within the Angus Glen Block: Barn Swallow, Bank Swallow, Bobolink, Eastern Meadowlark and Eastern Wood-pewee. Bank Swallows were noted foraging over the property but were not breeding. No Chimney Swifts were observed on either the Angus Glen or the Robinson Glen Blocks. The other five species are discussed below.

Barn Swallow is an aerial insectivore and is still a common species of rural landscapes. It nests in barns and other buildings while foraging mostly over fields, pastures, and water bodies. Within the Angus Glen Block, Barn Swallows were regularly seen foraging and breeding in several areas within the Block. Within the Subject Lands, two barns along Kennedy Road situated between the golf course and active agricultural fields held 10 active nests. Within the Robinson Glen Block, Barn Swallows were observed foraging over the agricultural fields and over the marsh and open habitats.

Wood Thrush and Eastern Wood-pewee were observed within the Robinson Glen block from within the forested areas, outside of the Subject Lands. Within the Angus Glen Block, three Eastern Wood-Pewee territories were found in the forest patches along Bruce Creek to the north of the clubhouse (outside of the Subject Lands). Wood Thrush is considered Threatened in Canada (Government of Canada 2017), with Eastern Wood-pewee being considered a species of Special Concern. These species are considered Species of Conservation Concern in Ontario.

Bobolink and Eastern Meadowlark are both grassland specialists. Bobolink is a songbird that usually breeds in extensive agricultural grasslands, especially hayfields, and old fields with tall, lush forb vegetation. Applicable to the Subject Lands, there were records of sixteen Bobolink males in the two uncut agricultural fields in the southwest corner of the Kennedy Road and Elgin Mills Road East intersection and one singing Eastern Meadowlark male was heard adjacent to Kennedy Road, however, this species was not seen on the property nor recorded in any of the subsequent visits. Within the Robinson Glen Block, agricultural field included row crops not suitable. Only one Bobolink was observed on the west side of the Minotar property (not within the Subject Lands), but was determined not to be breeding on site, as suitable breeding habitat was not present.

TRCA ranks species of regional conservation concern as L1 (highest concern) through L5 (least concern). Five species of birds ranked as species of regional concern (L1 to L3) were recorded on the

Legend

- Subject Lands
- Potential Bat Habitat
- Watercourse (MNRF 2019)
- Provincially Significant Wetland (MNRF 2020)
- Butternut Locations
- B3: Building Code: Number of Nesting Barn Swallow (2013)

Regulated Redside Dace Habitat

- Contributing Habitat
- Occupied Habitat
- Meander Belt
- Meander Belt + 30 m

Species at Risk Habitat | **Figure 4**

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Subject Lands. There were eleven significant bird species observed on the Robinson Glen Block, except for Barn Swallow, Horned Lark (*Eremophila alpestris*), and Vesper Sparrow (*Pooecetes gramineus*), all significant bird species were observed only within the Greenbelt Plan Area outside of the Subject Lands. Pileated Woodpecker Brown Thrasher (*Toxostoma rufum*), Vesper Sparrow (*Pooecetes gramineus*), and Bobolink (discussed above), all of which are ranked as L3 and were considered to be breeding within the Angus Glen Block. Brown Thrasher is a common thicket species. Two territories were found, both on the boundary of the Angus Glen Block, so it is likely that at least part of their territories may be on adjacent properties. Vesper Sparrow, while not particularly common, is a species of dry short-grass fields, short-grass pastures, and cultivated fields. One Vesper Sparrow territory was in the active agricultural fields in the southwest corner of the Kennedy Road and Elgin Mills Road East. The fifth species, Great Blue Heron (*Ardea herodias*) was not breeding on the on the Angus Glen Block. Bobolink is discussed above.

Seven species considered to be area-sensitive were recorded on the Angus Glen Block. Area-sensitive species are those which either require larger patches of habitat in which to breed or which are more productive in larger patches of suitable habitat. These seven species include three grassland-sensitive species (Savannah Sparrow, Bobolink, and Eastern Meadowlark). Two of the grassland-sensitive species are discussed above. The third, Savannah Sparrow, is a species that is found very frequently in both agricultural and old fields in Southern Ontario. Although the Savannah Sparrow requires large areas of open land, it will breed in many types of large field habitats.

3.2.2.5 Potential Bat Habitat

In the early stages of the studies on the Angus Glen and Robinson Glen Block, suitable habitat for bat maternity- and day- roosting was identified. Additionally, this exercise has identified several locations that require further study, not addressed in the MESPs, that may provide bat maternity- and day-roosting habitat and are within the Subject Lands boundaries. The following areas were identified as having the potential to provide habitat and are illustrated on **Figure 4**:

- The forested feature (FOD) associated with the Bruce Creek valley crossing of Kennedy Road north of the Elgin Mills Road intersection;
- Cultural woodlands (CUW) within the northeast corner of the Kennedy Road and Major Mackenzie Drive East intersection;
- Cultural woodlands feature (CUW) within the southeast corner of the Kennedy Road and Major Mackenzie Drive East intersection; and
- Central Woodland feature (SWD2-2) on Angus Glen Golf Course Lands (also identified as Significant Woodland and PSW) directly south of the Angus Glen clubhouse on the west of Kennedy Road.

4. Designated Natural Heritage Features

4.1 Headwater Drainage Features and Watercourses

All headwater drainage features/watercourses within the Subject Lands were evaluated using the *Evaluation, Classification and Management of Headwater Drainage Features Guidelines* (CVC and TRCA 2014). The HDF recommendations outlined in the MESP's are as follows:

- "No Management" requirements for six HDFs. As a result, no further assessment is required for these HDFs;
- "Mitigation" management recommendations for five HDFs; and
- "Conservation" management recommendation for two HDFs.

The SWS identified management recommendations for several HDFs within the Subject Lands are identified as "Mitigation". This includes HDFs BR1-H1(1)/H1(2), BR1-H2, BR1-H4(1) and BR1-H20. These HDFs are all drainage (tiled and open) systems that deliver flows to Bruce Creek at various locations along the tributary system within the Subject Lands. BR1-H1 includes a series of ponds connected by pipes, eventually discharging to Bruce Creek. HDF RO1-H9/H4 receives perennial flow from a field tile that infiltrates into the ground before reaching Robinson Creek.

Table 2. Subwatershed Study Headwater Drainage Feature Recommendations

ID	Feature Description	Flow Regime	SWS Management Recommendation
BR1-H1	Series of ponds connected by pipes, eventually discharging to Bruce Creek.	Ephemeral	Mitigation through LID BMPs and /or other measures to maintain function.
BR1-H2	Tile or pipe beneath golf course.	Ephemeral	Mitigation through LID BMPs and /or other measures to maintain function.
BR1-H4	Tile or pipe beneath golf course.	Ephemeral	Mitigation through LID BMPs and /or other measures to maintain function.
BR1-H20	Field tile discharging water with no surface feature connecting to Robinson Creek.	Perennial	Mitigation through LID BMPs and /or other measures to maintain function.
RO1-H9/H4	Field tile discharging water with no surface feature connecting to RO1-H9	Perennial	Conservation - the upstream portion of this HDF will be realigned and naturalized. Water flow to the HDF will be maintained through the SWM outlet from underground SWM facilities.

As part of the HDF assessments completed for as part of the MESPs, it was concluded that the hydrologic functions of the HDFs shall be replicated throughout the Angus Glen and Robinson Glen Block (surrounding the Subject Lands). HDF RO1-H9 has a management recommendation of "Conservation", therefore water must continue to reach this general location and be provided the opportunity to infiltrate. The upper portion of HDF RO1-H9 will be realigned within the Greenway System, and drainage has been directed to it as part of the SWM Plan for Robinson Glen Block.

4.2 Habitat of Endangered or Threatened Species

4.2.1 Redside Dace

Bruce Creek is identified by MECP as Redside Dace occupied habitat as it flows through the Subject Lands with records as recent as 2009. As part of the SWS, the potential for Redside Dace contributing habitat, based on the description provided in Section 29.1 of the Ontario Regulation 242/08, was determined. Redside Dace is listed Provincially and Federally as Endangered. Redside Dace habitat is defined in Section 29.1, Ontario Regulation 242/08 of the ESA (2007) as:

1. *Any part of a stream or other watercourse that is being used by a Redside Dace (i.e., occupied habitat);*
2. *Any part of a stream or other watercourse that was used by a Redside Dace at any time during the previous 20 years and that provides suitable conditions for a Redside Dace to carry out its life processes (i.e., recovery habitat);*
3. *The area encompassing the meander belt width of an area described in number 1 (i.e., occupied habitat);*
4. *The vegetated area or agricultural lands that are within 30 metres of an area described in number 2 (i.e., meander belt); and*
5. *A stream, permanent or intermittent headwater drainage feature, groundwater discharge area or wetland that augments or maintains the baseflow, coarse sediment supply or surface water quality of a part of a stream or other watercourse described in number 1 (i.e., occupied habitat) provided the part of the stream or watercourse has an average bankfull width of 7.5 metres or less (i.e., contributing habitat).*

The assessment of headwater drainage features, groundwater discharge areas and wetlands considered the potential to be designated contributing habitat based on the criteria in the Regulation. The appropriate Agencies agreed that the HDF guidelines and respective recommendation results could provide input to the determination of Redside Dace contributing habitat. HDFs, with a recommended management of protection or conservation, were contributing habitat.

4.2.2 Barn Swallow

Barn Swallows are designated threatened under the provincial ESA and are provided species and habitat protection under Section 9 and 10 of this legislation. This species builds their mud nests on any available ledges, vents or windowsills. Nests can also be built on vertical walls with rough surfaces (e.g., brick or wooden walls) under an overhang for overhead protection (MNRF 2017b). Barn Swallows require access to suitable open habitat for foraging and mud for nest building (Heagy *et al*. 2014); as such, nesting individuals are typically found within 200 m of grasslands, wetlands, riparian habitats and waterbodies (MECP 2019). Habitat for this species has been confirmed among the numerous buildings on the farms along Warden Avenue within the Subject Lands. Pre-construction nest surveys for Barn Swallow will be completed for any structures/buildings that will be affected by proposed works to determine permitting expectations (refer to **Figure 4**).

4.2.3 Bobolink and Eastern Meadowlark

There is suitable nesting habitat for two bird species, designated as threatened under the provincial ESA, is present within the Subject Lands. Due to their status both Bobolink and Eastern Meadowlark

are afforded species and habitat protection under Section 9 and Section 10 of the ESA legislation. Although both species were observed during investigation, results were not conclusive enough to confirm the presence of breeding pairs specific to the Subject Land boundaries. However, the presence of species within suitable nesting habitat identifies the requirement to complete future breeding bird surveys within any suitable nesting habitat that may be affected by proposed works to determine permitting expectations.

4.2.4 Butternut

The Butternut tree is designated Endangered in Ontario due to a fungal disease known as Butternut Canker, which kills most trees once they are infected. One Butternut was identified in the Subject Lands near one of the ponds close to Kennedy Road (**Figure 4**).

Under the ESA, if proposed development or site alteration may affect a Butternut tree or its habitat, the tree must be assessed to determine its health and confirm its status under the ESA. Under the assessment process, there are three categories of Butternut trees:

- Category 1 (Non-retainable): the Butternut tree is affected by butternut canker to such an advanced degree that retaining the tree would not support the protection or recovery of butternut trees in the area in which the tree is located;
- Category 2 (Retainable): the Butternut tree is not affected by butternut canker or the butternut tree is affected by butternut canker but the degree to which it is affected is not too advanced and retaining the tree could support the protection or recovery of Butternut trees in the area in which the tree is located; and
- Category 3 (Archivable): the Butternut tree may be useful in determining sources of resistance to butternut canker. Archivable trees are Category 2 trees that are over 20 cm DBH and within 40 m of a badly cankered Butternut.

Retainable and Archivable trees (Categories 2 and 3) are protected under the ESA; however, non-retainable (Category 1) trees are not protected. If required, a Butternut Health Assessment should be completed through the EA process to determine its status under the ESA.

4.2.5 Bat SAR

The significant woodlands associated with the Bruce Creek valley and cultural woodland communities within the Subject Lands may provide suitable maternity roost habitat. Species were not observed during field investigations; however, targeted surveys were not performed. Please refer to Section 5 for recommendations to complete future surveys regarding potential Bat SAR habitat within the Subject Lands. Mitigation, monitoring and compensation to address impacts to SAR bats may be required based on the results of additional surveys and consultation with the MECP.

4.3 Significant Valleylands

Significant Valleylands are identified in the PPS, Greenbelt Plan, York Region Official Plan and City of Markham Official Plan. Within these documents, they are generally defined as features that are “ecologically important in terms of features, functions, representation or amount, and contributing to the quality and diversity of an identifiable geographic area or natural heritage system” (PPS 2020). The

criteria and application of standards are more specifically defined in Table 8.1 of the Natural Heritage Reference Manual (2010). They include:

- Surface water functions;
- Groundwater functions;
- Landform prominence;
- Distinctive geomorphic landform;
- Degree of naturalness;
- Community and species diversity;
- Unique communities and species;
- Habitat value;
- Linkage function; and
- Restoration potential and value.

On the basis of these criteria and the application of the standards, the entire Bruce Creek valley as it traverses the Subject Lands has been identified to be Significant Valleyland.

4.4 Significant Wildlife Habitat

The Natural Heritage Reference Manual Technical Guide (2005) describes four categories of Significant Wildlife Habitat (SWH):

- Habitat of seasonal concentrations of animals;
- Rare vegetation communities or specialized habitat for wildlife;
- Habitat of species of conservation concern; and
- Animal movement corridors.

Candidate Bat Maternity Colonies habitat may be found within the wooded areas of the Subject Lands. Forested communities (FOD, FOM, SWD, and SWM ecosites) are associated with Bruce Creek valley. Maternity colonies may be in deciduous or mixed forest stands with >10/ha large diameter (>25cm dbh) wildlife trees. In addition, the likely presence of bat maternity roosting areas for non-SAR would qualify the Bruce Creek corridor as Candidate SWH. The confirmation of habitat significance will be determined through appropriate field surveys and in consultation with MECP where trees are proposed for removal.

Based on the criteria set out in the Significant Wildlife Habitat Technical Guide (MNR 2000), Candidate SWH is present within the Bruce Creek corridor on the Angus Glen Block. The presence of three individuals of Eastern Wood-pewee, which is a species of Special Concern means that the suitable habitat for this species could be designated SWH by the municipality.

4.5 Provincially Significant Wetlands

As part of the planning process for the FUA, MNRF requested that wetland evaluations be completed for all wetlands in the Bruce Creek and Berczy Creek subwatershed areas. The outcome of the evaluation process would then be integrated with the City's ongoing planning studies. It was agreed that a scoped evaluation process would be undertaken in recognition of the presence of Redside Dace, a SAR, which would elevate the scoring immediately to PSW status. Bruce Creek is designated

occupied Redside Dace habitat through the Angus Glen Block. PSW mapping was released by MNRF in February 2017 and updated in August 2017. Their evaluation designated the wetlands through the Berczy and Bruce Creek valleys, including within the Angus Glen Block as part of the Bruce-Berczy Creek PSW Complex. Some wetland boundaries were staked and surveyed with the MNRF in 2014 and 2015. Others were identified from ELC mapping (aerial photograph interpretation and site ground-truthing). **Figure 3** illustrates the portions of the Bruce-Berczy Creek PSW Complex on identified within the Subject Lands (i.e., the small SWD2-2 feature on Angus Glen Golf Course Lands).

4.6 Significant Woodlands

Significant woodlands are defined based on regional Official Plan criteria that primarily include the application of size thresholds and proximity to other features. One of the City of Markham's objectives is to protect and enhance woodlands of all sizes, and to increase the amount of woodland in Markham through acquisition, protection, compensation, and restoration within the NHN and adjacent to key natural heritage features and key hydrologic features (AMECFW SWS Report Phase 2 2017). For the Subject Lands, the applicable significant woodland criteria include:

- Size of 0.5 ha or larger; and
- Directly supports globally or provincially rare plants, animals or communities as assigned by the Natural Heritage Information Centre;
- Directly supports threatened or endangered species; or
- Is within 30 metres of a provincially significant wetland or wetland, waterbody, permanent stream, or intermittent stream.

Prior to the application of these criteria however, a wooded feature must first meet the criteria to be designated a "woodland". These criteria include measures of tree density and dimensions. The Greenbelt Plan also has criteria for definition of a woodland. In addition to the density criterion, within the Greenbelt, a wooded area may qualify as a woodland if it has a tree canopy of greater than 60% as determined through aerial photography.

All woodlands within the Bruce Creek valley meet the test of significance by virtue of their proximity to Redside Dace habitat. The Bruce Creek valley through the Angus Glen Block supports a variety of habitats including the wetlands, woodlands, cultural meadows, and cultural plantations. It is a Significant Valleyland as defined by the PPS with several Significant Woodlands, Significant Wetlands, and habitat of Endangered or Threatened Species present. The Central Woodland Feature on Angus Glen Golf Course Lands (SWD2-2 community) is designated as Significant Woodlands and as a PSW.

4.7 Greenway System

The Greenway System was identified through the MESPs for the Angus Glen and Robinson Glen Blocks, primarily associated with the Bruce Creek valley. As defined by the City's Official Plan, policies 3.1.1.2, 3.1.2.1, 3.1.3 and 3.1.4, the Greenway System includes the following:

- NHN lands including:
    - Natural heritage and hydrologic features and their functions;
    - Key natural heritage features and key hydrologic features;
    - Valleylands;

    - Woodlands and unevaluated wetlands;
- Vegetation protection zones associated with the features above;
- Hazardous lands and hazardous sites;
- Natural Heritage Network Enhancement lands, including Core Area Enhancements, Core Linkage Enhancements and Natural Heritage Restoration Areas;
- Rouge Watershed Protection Area;
- Oak Ridges Moraine Conservation Plan Area lands;
- Greenbelt Plan Area lands; and
- Certain naturalized stormwater management features.

5. Recommendations for Mitigation and Avoidance Measures

5.1 Erosion and Sediment Control

Prior to any construction, a detailed *Erosion and Sediment Control Plan* will be developed using the Greater Golden Horseshoe Area Conservation Authorities' Erosion and Sediment Control Guidelines for Urban Construction (2019).

Proposed erosion controls include the phasing of earthworks, seeding or hydro seeding, using erosion control blankets or the implementing scarification, to limit the amount of exposed soil during construction.

Sediment control measures will include mud mats at construction entrances, sediment control fencing and tree protection fencing, temporary sediment control ponds, temporary sediment traps and diversion swales with rock check dams. These measures will allow sediment to settle and prevent sediment laden water from entering watercourses and other natural features. It will also keep public roadways free of debris during the construction period.

5.2 Tree Removal and Preservation

The following general guidelines should be adhered to for sound arboricultural methods of tree removal and pruning. Further, there is a need for nest surveys during the breeding bird season prior to removal of any specimens. The Tree Inventory provides a survey of all trees within the subject lands outside of woodland features (**Appendix A**).

- To ensure compliance with the federal MBCA (1994), any vegetation clearing between April 1 and August 30 should only occur after an ecologist with appropriate avian knowledge has surveyed the area to confirm no breeding birds are present.
- Disturbance to bat roosting habitat will be avoided during the bat roosting period.
- The contractor is to erect ESC fencing prior to any works beginning, at the direction of the engineer.
- Prior to tree clearing plywood hoarding shall be erected inspected by a qualified arborist prior to clearing beginning.

- Clearing activities occurring adjacent to trees for preservation shall be supervised by a qualified Arborist.

5.3 Timing Windows

The MBCA (1994) and provincial *Fish and Wildlife Conservation Act* (1997) protect the nests, eggs and young of most bird species from harm or destruction. As the breeding bird season in southern Ontario is generally from mid-April to mid-July, the clearing of vegetation should occur outside of these periods. For any proposed clearing of vegetation within these dates, or where birds may be suspected of nesting outside of typical dates, an ecologist should undertake detailed nest searches immediately prior to site alteration to ensure that no active nests are present.

Disturbance to bat roosting habitat will be avoided during the bat roosting period, with emphasis on avoiding potential effects during the maternity period and in accordance with MECP requirements. Bat roost tree and exit/acoustic surveys should be undertaken by a qualified biologist prior to construction activity occurring, as directed by MECP. Exit/acoustic surveys are to be completed during the month of June.

Bruce Creek is designated as Redside Dace habitat, therefore works within the regulated habitat (meander belt + 30 m for occupied and in water works for contributing features) (**Figure 4**) must be conducted from July 1 to September 15, unless otherwise directed by MECP. Any water discharged to the tributaries should address the criteria set in the *Guidance for Development Activities in Redside Dace Protected Habitat* (MNRF 2016).

If construction activities are scheduled during the nesting season for Barn Swallow (April 1 to August 31), a nest search shall be undertaken to confirm that no Barn Swallows are or have been nesting on structures that may be affected by construction activities on or near these areas. If possible, the area will be excluded prior to nesting season to dissuade use of these areas for nesting, and replacement nesting structures provided, if required by MECP. Additional monitoring measures will be developed with the MECP, if required.

5.4 Fish and Wildlife Rescue

Should in-water work (within tributaries or within ponds) fish and collection permits, under the Fish and Wildlife Conservation Act will be necessary to relocate fish or amphibians or reptiles. Relocations shall be conducted during the appropriate timing windows and with the required permitting in place.

5.5 Headwater Drainage Features

The MESP's have identified that the functions of HDFs shall be maintained or replicated in accordance with SWS recommendations through mitigative and protection measures. As identified within the MESP, the HDF mitigation requirements are recommended to maintain the functions.

5.6 Potential Additional Surveys and Future Commitments

It is recommended that the following surveys be confirmed and undertaken as required in future design phases and prior to any construction activities (e.g., vegetation removal, building demolition, etc.):

- All structures / buildings that are anticipated to be modified or replaced to facilitate the proposed works should be inspected for nests or nesting activity of Barn Swallow as well as MBCA protected birds. These surveys can occur at any time of year but must be completed prior to onset of construction activities; and
- In future design phases of the project, it is recommended that bat habitat surveys, in accordance with applicable regulations and protocols, be completed should they be required. MECP should be consulted to determine whether acoustic monitoring or leaf-on surveys are required at the locations identified in Section 3.2.2.4.

If future design phases identify the requirement to complete project activities within 25 metres of the identified butternuts (i.e., critical root zones), then a butternut health assessment must be completed by a certified Butternut Health Assessor to confirm the health category of the tree.

Breeding bird surveys should be completed within the suitable nesting habitat for Bobolink, if impacts to the suitable habitat are anticipated based on future design phases.

6. Project Permitting and Regulatory Considerations

6.1 Federal legislation

6.1.1 Species at Risk Act, 2002

The Bruce Creek is identified as occupied Redside Dace habitat. Reside Dace is listed as Endangered under Schedule 1 of the SARA. Effects to listed aquatic species at risk, any part of their critical habitat or the residences of their individuals in a manner which is prohibited under sections 32, 33 and subsection 58(1) of SARA. Critical habitat for this species has yet to be defined within the recovery strategy of the species. Proposed work below the highwater mark of an occupied Reside Dace watercourse will require a SARA permit.

6.1.2 Fisheries Act, 1985

Upon confirmation of construction methodology during future design phases, should any project activities occur below the highwater mark of any of the identified watercourses or headwater drainage features within the Subject Lands, an assessment of potential impacts on fish and fish habitat should be completed and submitted to DFO for project review. Compliance with the fish habitat protection provisions of the *Fisheries Act* will require the application of measures to avoid causing the death of fish and/or the HADD of fish habitat. Upon consultation with DFO, if death of a fish and/ or HADD of fish habitat cannot be avoided after the application of the appropriate protection and mitigation measures, a letter of approval or an authorization from DFO may need to be obtained.

6.1.3 Migratory Birds Convention Act, 1994

It is likely that future design phases will identify the requirement for vegetation/tree removal and construction activities that may negatively affect buildings and structures. To avoid contravention of the MBCA, the recommended mitigation measures and avoidance timing windows as described in **Section 5.3** shall be adhered to. No permits under this MBCA are anticipated to be required provided the mitigation measures and avoidance timing windows are implemented.

6.2 Provincial

6.2.1 Endangered Species Act, 2007

All required authorizations in accordance with the ESA legislation for any impacts to all confirmed SAR and SAR habitat identified through the EA process and future design phases, shall be complied with and obtained.

Bruce Creek is identified as occupied Redside Dace habitat. Habitat, as regulated under Section 10 of the ESA includes the meander belt width, plus 30 m on either side of an occupied reach and a stream. “Contributing habitat” includes a permanent or intermittent headwater drainage feature, groundwater discharge area or wetland that augments or maintains the baseflow, coarse sediment supply or surface water quality to an occupied reach. A 100 m meander belt dimension was recommended for Reach BR1-1b (Bruce Creek crossing of Kennedy Road). Any project activities that take place within the regulated habitat of this species will require permissions from MECP under the ESA and may be subject to a 17(2)(c) permit under the ESA.

Nest surveys for Barn Swallow are recommended for any structures/buildings that will be affected by proposed work to determine permitting expectations. As Barn Swallows tend to re-use nests from year to year (Brown and Brown 1999), their nests (i.e., active, or non-active at time of survey) are protected year-round under the ESA. Where loss or disturbance cannot be avoided (e.g., due to demolition of buildings), all requirements under the ESA will be met prior to construction, including any compensation, replacement structures and / or authorization requirements.

Breeding bird surveys should be completed within the suitable nesting habitat for Bobolink and Eastern Meadowlark, if impacts to the suitable habitat are anticipate based on future design phases. MECP shall be consulted as required, based on the results of these surveys.

If future design phases identify the requirement to complete project activities within 25 metres of the identified butternuts (i.e., critical root zones), then a butternut health assessment must be completed by a certified Butternut Health Assessor to confirm the health category of the tree. It is recommended that DNA testing also be completed to confirm if the affected butternuts are pure as the ESA protection does not apply to hybrids. Where removal or disturbance cannot be avoided (i.e., work within critical root zones), all requirements under the ESA will be met prior to construction, including any species-specific mitigation/ monitoring, compensation and any other registration or permitting requirements under the ESA.

6.2.2 Additional Municipal Requirements

Environmental design and mitigation measures should be developed through the EA process to avoid and/or minimize any anticipated project impacts to natural heritage features. Measures proposed to protect the natural heritage areas associated with the small PSW associated with the Bruce Creek valley shall be presented to the appropriate regulatory agencies for their review and approval.

Should trees and/or woodlands require removal or partial removal, appropriate compensation will be sought so as to be compliant with the applicable bylaws and agency requirements.

Efforts shall be made during later project phases in the EA process to avoid, as much as possible, impacts to KNHF and KHFs and the NHN. Preliminary environmental design and mitigation measures have been proposed in Section 5 to minimize negative impacts on natural heritage.

It is recommended that specific environmental design and mitigation measures be developed for the Project to minimize negative impacts on natural heritage areas and be presented to applicable agencies for their review and approval. The proposed road widening should minimize and avoid negative impacts on the natural feature or its ecological functions if the recommendations in Section 5, and as developed through the EA process, are being implemented.

During the EA process later project phases, design considerations shall be made that ensures maintaining the connectivity of the Greenway System and allowing movement of amphibians and other wildlife.

6.2.3 TRCA Regulation Policies

Bruce Creek and all HDFs and wetlands are regulated by TRCA. In this regard, a permit will be required from TRCA for any proposed development and site alteration prior to construction.

Crossing designs should have regard for the LCP as well as TRCA's "Crossings Guideline for Valley and Stream Corridors" (2015).

7. Conclusions

Beacon was retained by the Region to produce an NER to inform the Class EA process for the proposed improvements of Kennedy Road from Major Mackenzie Drive to Elgin Mills Road in the City of Markham. The Subject Lands are located within the North Markham FUA and captures portions of the Bruce Creek and Robinson Creek subwatersheds; both watercourses are tributaries of the Rouge River. The purpose of this NER was to summarize available background information and confirm existing conditions for the Subject Lands relevant to the Warden Avenue Class EA Study Area.

The following natural heritage features are present within the Subject Lands:

1. *One PSW;*
2. *Suitable and/ or confirmed habitat of endangered and threatened species*
    a. *Redside Dace: Bruce Creek (occupied habitat);*

   b. *Barn Swallow;*
   c. *Butternuts*
   d. *Bobolink; and,*
   e. *SAR Bats.*
3. *Fish habitat;*
4. *Significant woodlands; and,*
5. *Significant valleyland.*

Any works proposed within the Subject Lands will require authorisation, permits or other permissions from the Region, City of Markham, TRCA, MECP and DFO, as necessary.

Should you have any questions or require any additional information please contact the undersigned.

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Appendix A

Tree Inventory

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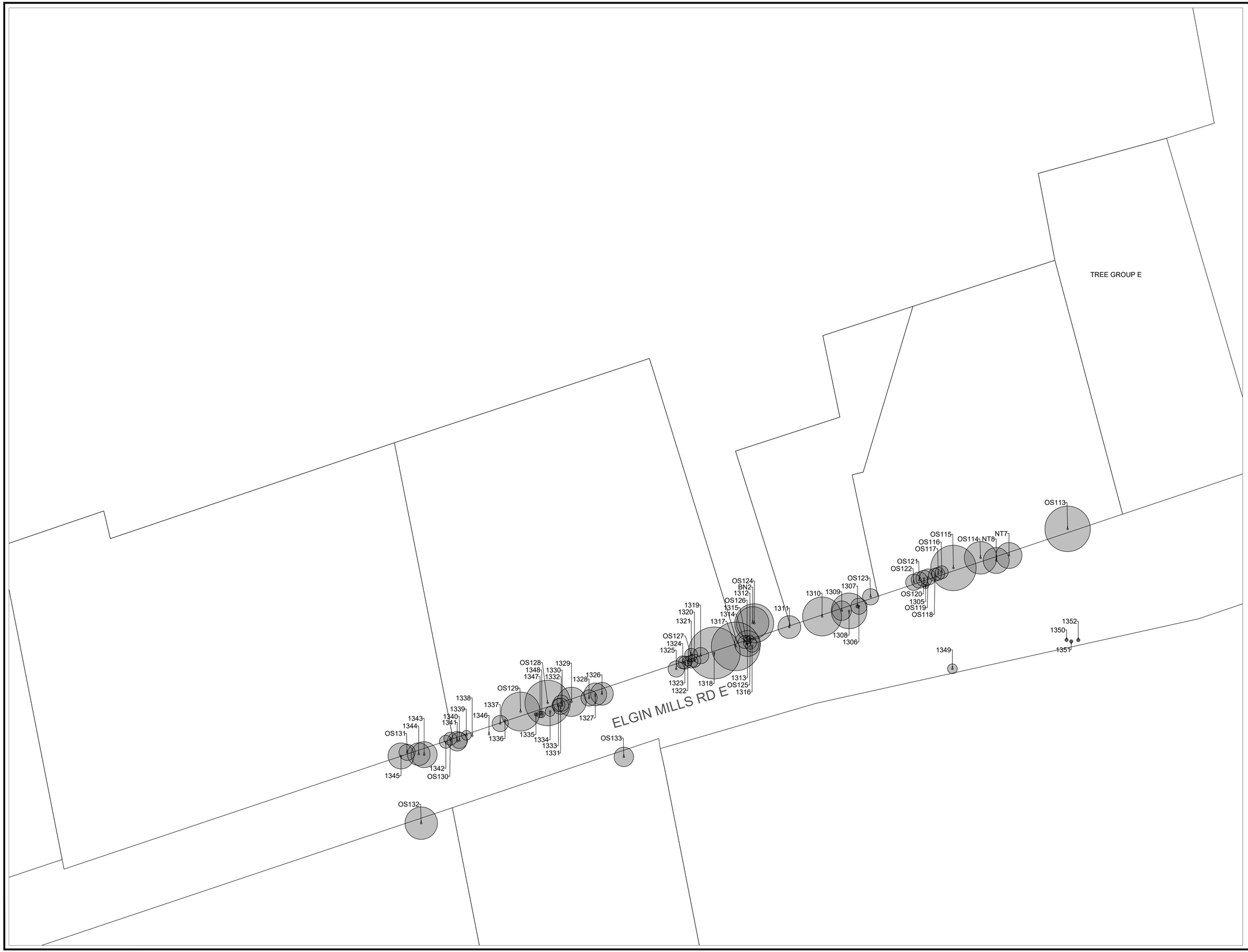
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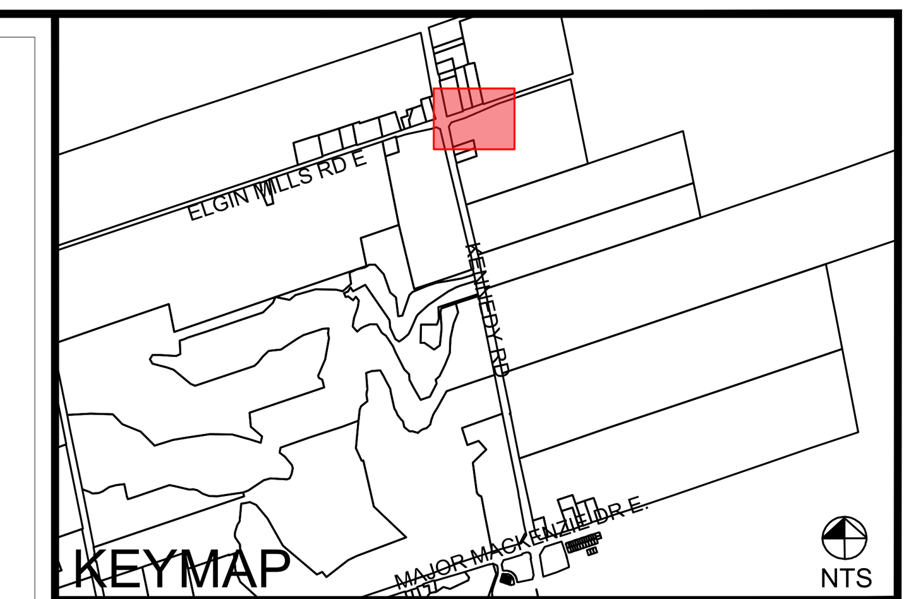

LEGEND

1678 Tree tag

Tree Crown

Tree Location

Notes: Scale shown is for an 36" x 24" page.
For illustrative purposes. Do not scale

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REGIONAL MUNICIPALITY OF YORK

PROJECT

KENNEDY ROAD TREE INVENTORY

SHEET TITLE

TREE INVENTORY PLAN

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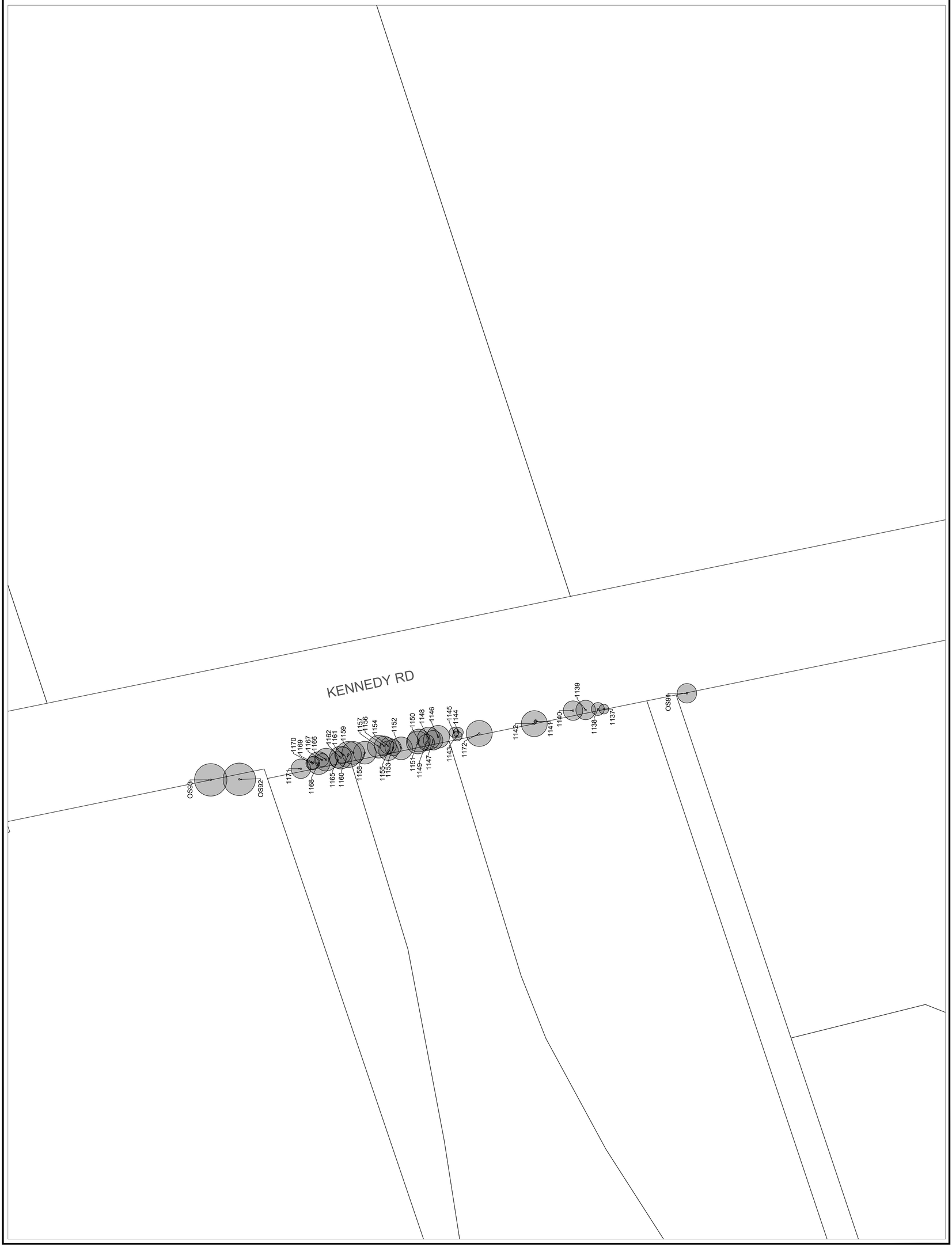
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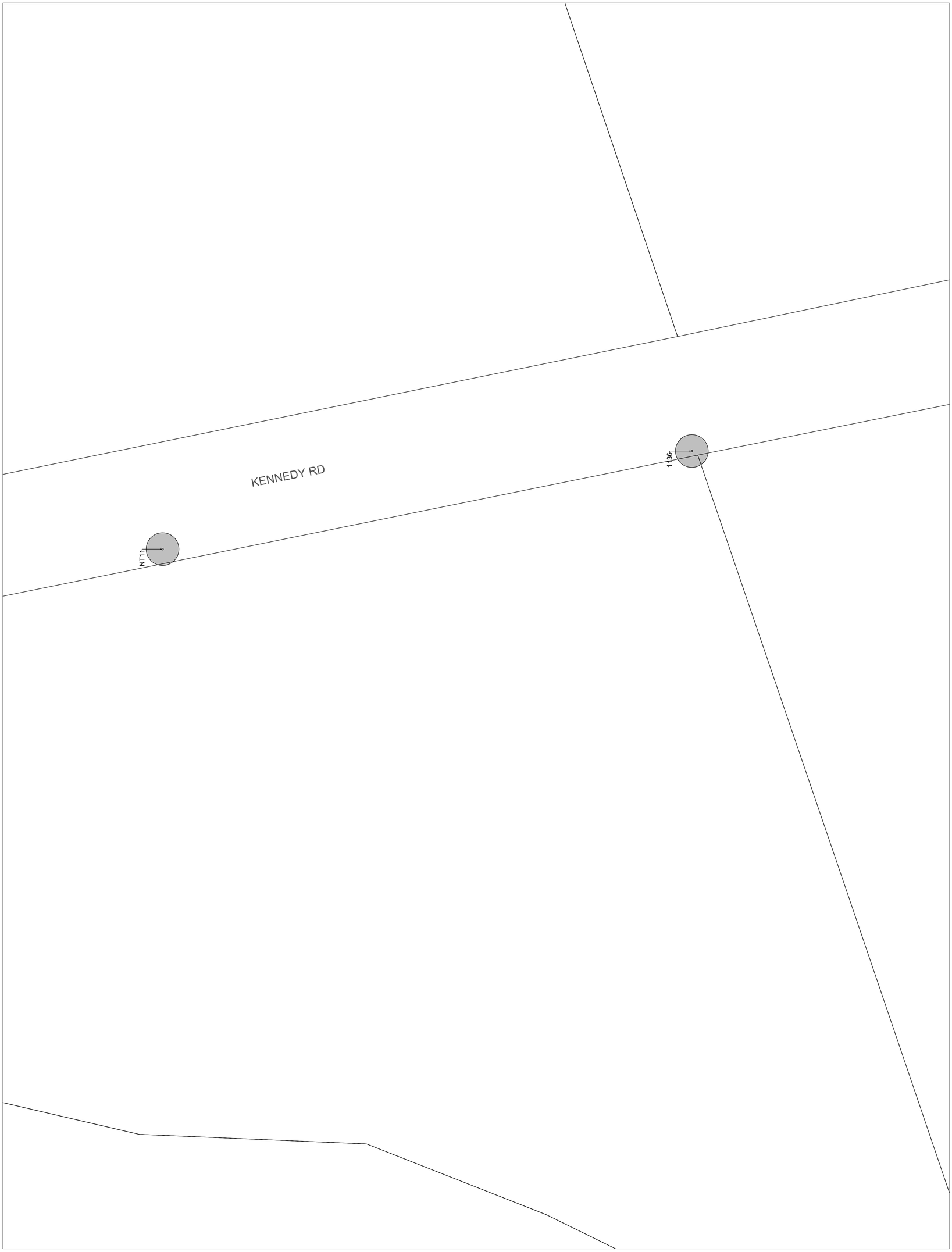
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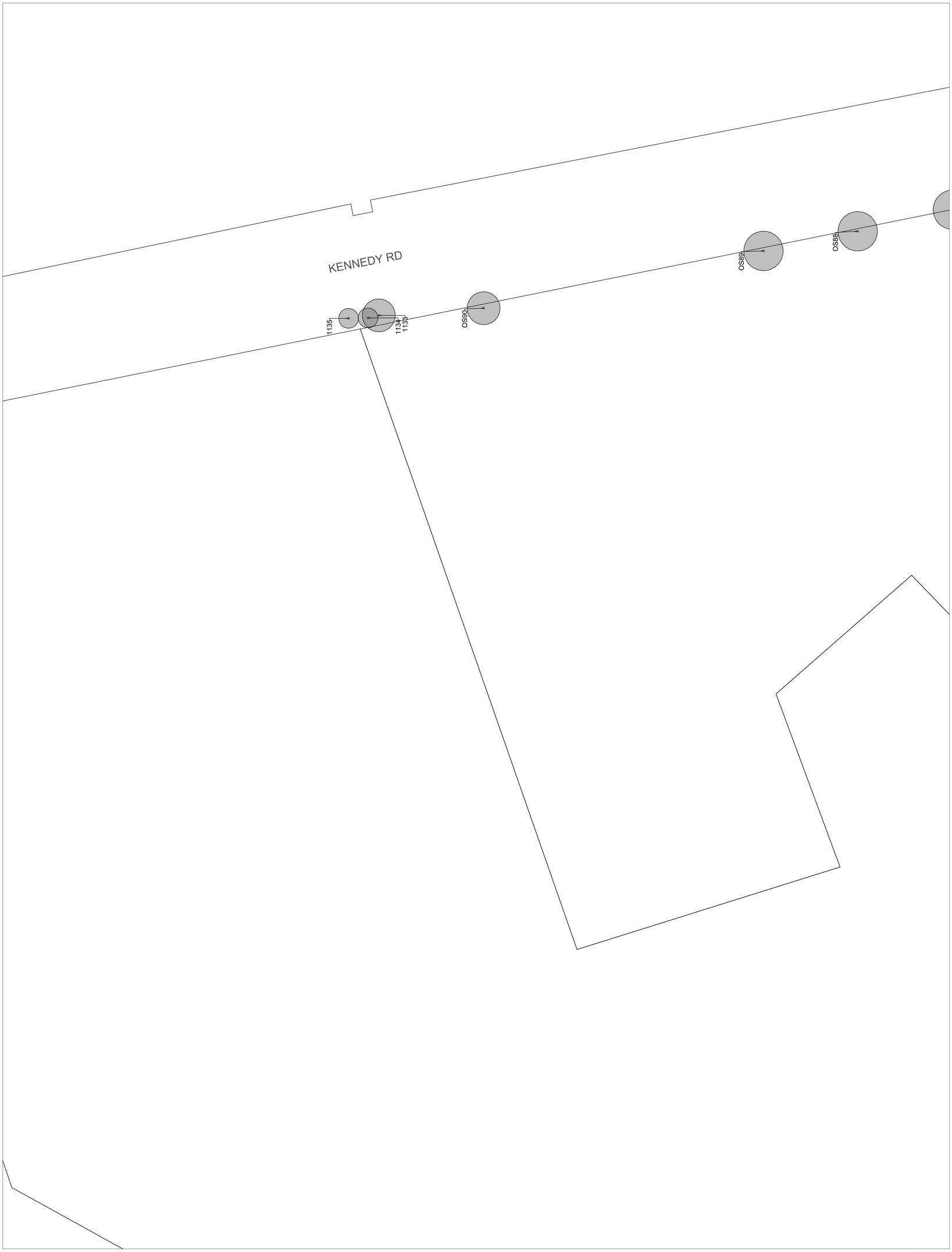
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KENNEDY RD

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TREE GROUP C

TREE GROUP B

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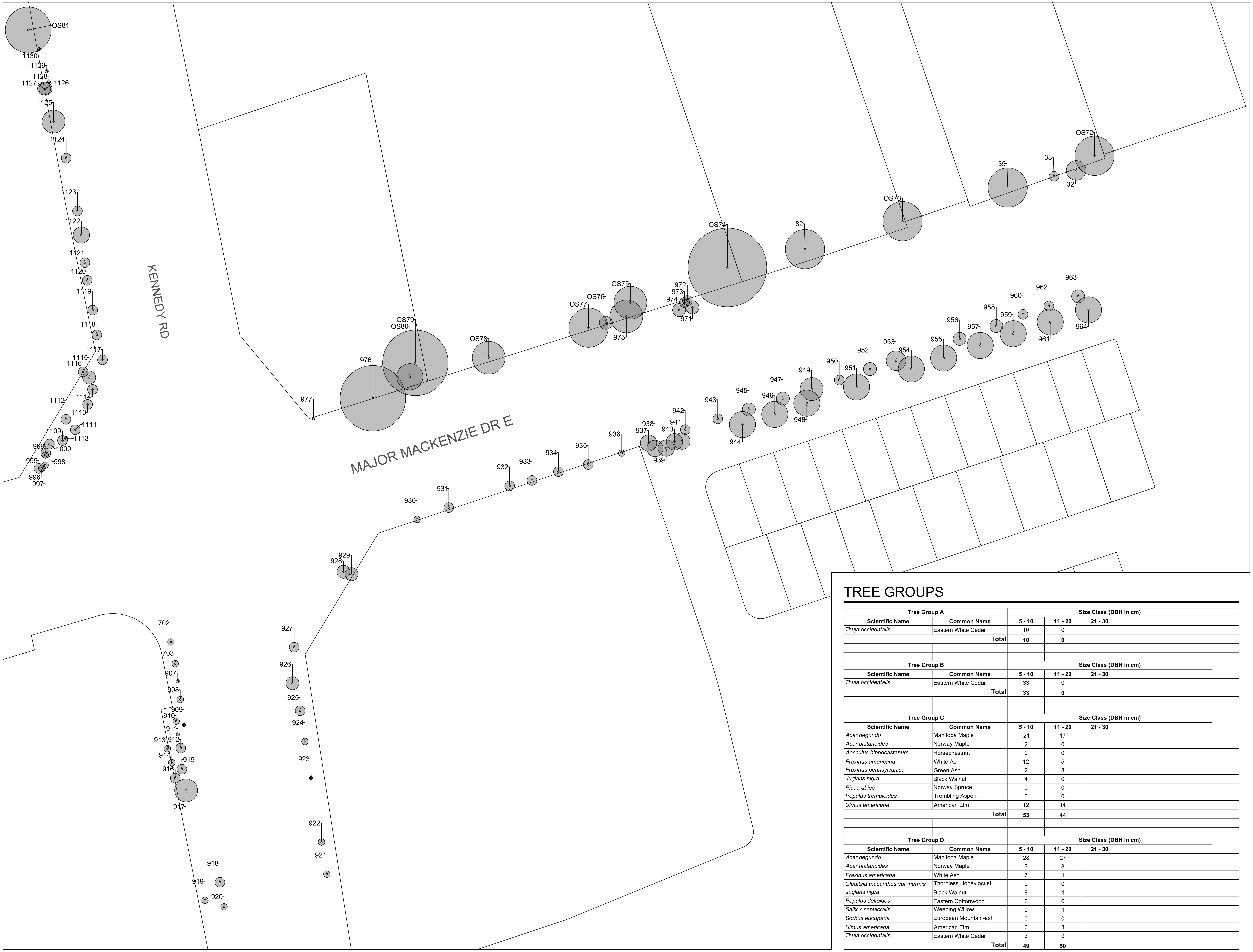

TREE GROUPS

Tree Group A		Size Class (DBH in cm)		
Scientific Name	**Common Name**	**5 - 10**	**11 - 20**	**21 - 30**
Thuja occidentalis	Eastern White Cedar	10	0	
	Total	**10**	**0**	

Tree Group B		Size Class (DBH in cm)		
Scientific Name	**Common Name**	**5 - 10**	**11 - 20**	**21 - 30**
Thuja occidentalis	Eastern White Cedar	33	0	
	Total	**33**	**0**	

Tree Group C		Size Class (DBH in cm)		
Scientific Name	**Common Name**	**5 - 10**	**11 - 20**	**21 - 30**
Acer negundo	Manitoba Maple	21	17	
Acer platanoides	Norway Maple	2	0	
Aesculus hippocastanum	Horsechestnut	0	0	
Fraxinus americana	White Ash	12	5	
Fraxinus pennsylvanica	Green Ash	2	8	
Juglans nigra	Black Walnut	4	0	
Picea abies	Norway Spruce	0	0	
Populus tremuloides	Trembling Aspen	0	0	
Ulmus americana	American Elm	12	14	
	Total	**53**	**44**	

Tree Group D		Size Class (DBH in cm)		
Scientific Name	**Common Name**	**5 - 10**	**11 - 20**	**21 - 30**
Acer negundo	Manitoba Maple	28	27	
Acer platanoides	Norway Maple	3	8	
Fraxinus americana	White Ash	7	1	
Gleditsia triacanthos var inermis	Thornless Honeylocust	0	0	
Juglans nigra	Black Walnut	8	1	
Populus deltoides	Eastern Cottonwood	0	0	
Salix x sepulcralis	Weeping Willow	0	1	
Sorbus aucuparia	European Mountain-ash	0	0	
Ulmus americana	American Elm	0	3	
Thuja occidentalis	Eastern White Cedar	3	9	
	Total	**49**	**50**	

TREE INVENTORY TABLE

Tag/Tree No.	Scientific Name	Common Name	DBH (cm)	Crown Diameter (m)	Condition[1]	Comments
32	Picea pungens	Colorado Blue Spruce	31	6	Good	Good form and vigour; Crown raised.
33	Aesculus glabra	Ohio Buckeye	13	3	Good	Good form and vigour.
35	Tilia cordata	Littleleaf Linden	61	12	Fair-Good	Minor dieback and thinning.
82	Acer platanoides	Norway Maple	46	12	Good	Good form and vigour.
889	Ulmus sp	Elm Cultivar	10	5	Good	Good form and vigour.
890	Ulmus sp	Elm Cultivar	11	5	Good	Good form and vigour.
891	Ulmus sp	Elm Cultivar	10	5	Good	Good form and vigour.
892	Picea glauca	White Spruce	24	5	Fair	Moderate dieback and thinning.
893	Ulmus sp	Elm Cultivar	11	5	Good	Good form and vigour.
894	Picea abies	Norway Spruce	26	5	Fair	Moderate dieback and thinning.
895	Ulmus sp	Elm Cultivar	11	5	Good	Good form and vigour.
896	Picea abies	Norway Spruce	18	NA	Dead	Standing snag; Potential risk tree.
897	Ulmus sp	Elm Cultivar	10	5	Good	Good form and vigour.
898	Picea abies	Norway Spruce	26	5	Good	Good form and vigour.
899	Ulmus sp	Elm Cultivar	11	5	Good	Good form and vigour.
900	Picea abies	Norway Spruce	25	6	Fair-Good	Minor dieback and thinning.
901	Ulmus sp	Elm Cultivar	10	5	Good	Good form and vigour.
902	Ulmus sp	Elm Cultivar	10	5	Good	Good form and vigour.
903	Picea abies	Norway Spruce	24	6	Fair-Good	Minor dieback and thinning.
904	Picea abies	Norway Spruce	24	5	Good	Good form and vigour.
905	Picea abies	Norway Spruce	19	5	Good	Good form and vigour.
906	Acer negundo	Manitoba Maple	15, 8, 12	6	Good	Good vigour; Stems fork near ground.
907	Syringa reticulata	Japanese Lilac	4	1	Good	Good form and vigour
908	Syringa reticulata	Japanese Lilac	10	2	Good	Good form and vigour
909	Acer campestre	Hedge Maple	9	1	Good	Good form and vigour
910	Syringa reticulata	Japanese Lilac	10	2	Good	Good form and vigour
911	Acer campestre	Hedge Maple	7	1	Fair-Good	Good form and vigour
912	Acer campestre	Hedge Maple	11	3	Good	Good form and vigour
913	Acer campestre	Hedge Maple	10	2	Good	Good form and vigour
914	Acer campestre	Hedge Maple	10	2	Fair-Good	Vertical wound with woundwood on trunk; Good form and vigour.
915	Acer campestre	Hedge Maple	10	3	Good	Good form and vigour.
916	Acer campestre	Hedge Maple	9	3	Good	Good form and vigour.
917	Robinia pseudoacacia	Black Locust	23, 12, 24	7	Fair	Stems fork below breast height; Moderate dieback and thinning.
918	Acer campestre	Hedge Maple	16	3	Fair-Good	Healthy full crown; Large vertical wound with woundwood along trunk.
919	Gingko biloba	Maidenhair Tree	8	2	Good	Good form and vigour.
920	Syringa reticulata	Japanese Lilac	13	2	Good	Good form and vigour.
921	Aesculus glabra	Ohio Buckeye	10	2	Fair-Good	Healthy crown; Vertical wound with exposed heartwood along half of tree.
922	Tilia cordata	Littleleaf Linden	12	2	Good	Good form and vigour.
923	Gingko biloba	Maidenhair Tree	7	1	Good	Good form and vigour.
924	Aesculus glabra	Ohio Buckeye	9	2	Good	Good form and vigour; Small vertical wound with woundwood along trunk.
925	Quercus sp.	Oak Cultivar	15	3	Fair-Good	Good vigour; Vertical wound along trunk; Minor insect damage.
926	Acer x freemanii	Freeman's Maple	13	4	Good	Good form and vigour.
927	Acer x freemanii	Freeman's Maple	13	3	Good	Good form and vigour.
928	Picea pungens	Colorado Blue Spruce	18	4	Good	Good form and vigour.
929	Picea pungens	Colorado Blue Spruce	21	4	Good	Good form and vigour.
930	Syringa reticulata	Japanese Lilac	8	2	Good	Good vigour; Tree leaning towards the south.
931	Syringa reticulata	Japanese Lilac	12	3	Good	Good form and vigour.
932	Syringa reticulata	Japanese Lilac	9	3	Good	Good vigour; Tree leaning towards the south.
933	Syringa reticulata	Japanese Lilac	11	3	Good	Good form and vigour.
934	Syringa reticulata	Japanese Lilac	8	3	Good	Good form and vigour.
935	Syringa reticulata	Japanese Lilac	8	3	Good	Good form and vigour.
936	Syringa reticulata	Japanese Lilac	8	2	Good	Good form and vigour.
937	Gymnocladus dioicus	Kentucky Coffeetree	18	5	Good	Good form and vigour.
938	Picea pungens	Colorado Blue Spruce	27	5	Good	Good form and vigour.
939	Picea pungens	Colorado Blue Spruce	24	5	Good	Good form and vigour.
940	Picea pungens	Colorado Blue Spruce	27	5	Good	Good form and vigour.
941	Picea pungens	Colorado Blue Spruce	26	5	Good	Good form and vigour.
942	Pyrus calleryana 'Chanticleer'	Chanticleer Pear	14	3	Fair-Good	Good vigour; Epicormic growth along trunk and from trunk flare.
943	Acer campestre	Hedge Maple	9	3	Good	Good form and vigour.
944	Acer platanoides	Norway Maple	28	8	Good	Good form and vigour.
945	Fagus sp.	Beech Cultivar	11	4	Good	Good form and vigour.
946	Acer platanoides	Norway Maple	23	8	Good	Good form and vigour.
947	Pyrus calleryana 'Chanticleer'	Chanticleer Pear	22	4	Good	Good form and vigour.
948	Acer platanoides	Norway Maple	27	8	Good	Good form and vigour.
949	Acer campestre	Hedge Maple	28	7	Good	Good form and vigour.
950	Fagus sp.	Beech Cultivar	10	3	Good	Good form and vigour.
951	Acer platanoides	Norway Maple	27	8	Good	Good form and vigour.
952	Pyrus calleryana 'Chanticleer'	Chanticleer Pear	21	4	Good	Good form and vigour.
953	Acer campestre	Hedge Maple	23	6	Good	Good form and vigour.
954	Acer platanoides	Norway Maple	29	8	Good	Good form and vigour.
955	Acer platanoides	Norway Maple	27	8	Good	Good form and vigour.
956	Gymnocladus dioicus	Kentucky Coffeetree	18	4	Good	Good form and vigour.
957	Acer platanoides	Norway Maple	28	8	Good	Good form and vigour.
958	Acer campestre	Hedge Maple	19	4	Good	Good form and vigour.
959	Acer platanoides	Norway Maple	26	8	Fair-Good	Trimmer damage to trunk flare; Good vigour.
960	Acer campestre	Hedge Maple	8	3	Good	Good form and vigour.
961	Acer platanoides	Norway Maple	27	8	Good	Good form and vigour.
962	Acer campestre	Hedge Maple	11	3	Good	Good form and vigour.
963	Gymnocladus dioicus	Kentucky Coffeetree	17	4	Good	Good form and vigour.
964	Acer platanoides	Norway Maple	30	8	Good	Good form and vigour; Narrow vertical crack with woundwood along trunk.
965	Gymnocladus dioicus	Kentucky Coffeetree	17	5	Good	Good form and vigour.
966	Acer platanoides	Norway Maple	31	8	Good	Good form and vigour.
967	Gymnocladus dioicus	Kentucky Coffeetree	19	5	Good	Good form and vigour.
968	Acer campestre	Hedge Maple	10	4	Good	Good form and vigour.
969	Betula alleghaniensis	Yellow Birch	28	8	Good	Good form and vigour.
970	Acer campestre	Hedge Maple	9	4	Fair-Good	Good vigour; Some epicormic growth at base of tree.
971	Acer negundo	Manitoba Maple	8, 4, 5	4	Fair-Good	Good vigour; Stems fork near ground.
972	Acer negundo	Manitoba Maple	9	3	Good	Growing into wire fence; Leaning towards the south.
973	Acer negundo	Manitoba Maple	7	3	Good	Good; Leaning towards the south.
974	Acer negundo	Manitoba Maple	9, 4, 3	4	Good	Stems fork near ground; Good vigour.
975	Acer negundo	Manitoba Maple	48	10	Fair-Good	Tree leaning towards the south; Uneven crown.
976	Ulmus pumila	Siberian Elm	110	20	Fair	DBH taken ~ 40 cm from ground as stems fork at breast height; Moderate dieback and thinning; Some insect damage to tree.
977	Ulmus pumila	Siberian Elm	5, 3, 2	1	Fair-Good	Stems fork at ground; Good vigour.
978	Acer x freemanii	Freeman's Maple	7	2	Good	Good form and vigour.
979	Acer x freemanii	Freeman's Maple	9, 2, 3, 4	2	Good	Good form and vigour.
980	Acer x freemanii	Freeman's Maple	8, 3, 1	2	Good	Good form and vigour.
981	Acer x freemanii	Freeman's Maple	7, 2, 2	2	Good	Good form and vigour.
982	Acer x freemanii	Freeman's Maple	5, 3, 3, 3	2	Good	Good form and vigour.
983	Acer x freemanii	Freeman's Maple	6, 5	2	Good	Good form and vigour.
984	Acer x freemanii	Freeman's Maple	6, 5	2	Good	Good form and vigour.
985	Acer x freemanii	Freeman's Maple	5, 5	2	Good	Good form and vigour.
986	Acer x freemanii	Freeman's Maple	5, 4, 3	2	Good	Good form and vigour.
987	Acer x freemanii	Freeman's Maple	5, 4	2	Good	Good form and vigour.
988	Acer x freemanii	Freeman's Maple	7	2	Good	Good form and vigour.
989	Acer x freemanii	Freeman's Maple	8, 4	2	Good	Good form and vigour.
990	Acer x freemanii	Freeman's Maple	6, 4, 4	2	Good	Good form and vigour.
991	Acer x freemanii	Freeman's Maple	6, 4	2	Good	Good form and vigour.
992	Acer x freemanii	Freeman's Maple	6, 5	2	Good	Good form and vigour.
993	Acer x freemanii	Freeman's Maple	4, 4, 4, 4	2	Good	Good form and vigour.
994	Acer negundo	Manitoba Maple	4, 5	3	Good	Stems fork near ground; Good vigour.
995	Picea glauca	White Spruce	7	3	Good	Good form and vigour.
996	Picea glauca	White Spruce	6	2	Good	Good form and vigour.
997	Picea glauca	White Spruce	8	2	Fair-Good	Minor dieback and thinning.
998	Juglans nigra	Black Walnut	6	2	Good	Good form and vigour.
999	Acer negundo	Manitoba Maple	7, 6, 6, 6,	3	Good	Stems fork from larger cut stump.
1000	Juglans nigra	Black Walnut	8, 8, 6, 9	3	Good	Stems fork near ground; Good vigour.
1101	Salix x sepulcralis	Weeping Willow	42	10	Fair	Moderate dieback and thinning; Relatively small crown.
1102	Acer negundo	Manitoba Maple	9	4	Fair-Good	Minor damage to stem.
1103	Salix x sepulcralis	Weeping Willow	73	12	Fair	Moderate dieback and thinning.
1104	Salix x sepulcralis	Weeping Willow	71	12	Fair	Moderate dieback and thinning.
1105	Salix x sepulcralis	Weeping Willow	49	11	Fair-Good	Minor dieback and thinning.
1106	Salix x sepulcralis	Weeping Willow	15	4	Fair-Good	Planted Willow with minor dieback.
1107	Salix x sepulcralis	Weeping Willow	23	4	Fair	Moderate dieback and dead lower lateral branches.
1108	Salix x sepulcralis	Weeping Willow	21	5	Fair-Good	Minor dieback; Some dead lower branches.
1109	Fraxinus pennsylvanica	Green Ash	5, 4, 4	3	Poor	Dying as a result of infestation from EAB.
1110	Picea glauca	White Spruce	12	3	Good	Good form and vigour.
1111	Picea glauca	White Spruce	12	3	Good	
1112	Acer negundo	Manitoba Maple	9, 9, 8, 7, 7, 7	3	Good	Stems fork near ground; Good vigour.
1113	Juglans nigra	Black Walnut	4	1	Good	Good form and vigour.
1114	Picea glauca	White Spruce	11	3	Good	Good form and vigour.
1115	Picea glauca	White Spruce	15	4	Good	Good form and vigour.
1116	Acer saccharinum	Silver Maple	6	3	Good	
1117	Juglans nigra	Black Walnut	8	3	Good	Good form and vigour.
1118	Juglans nigra	Black Walnut	7	3	Good	Good form and vigour.
1119	Juglans nigra	Black Walnut	8	3	Good	Good form and vigour.
1120	Juglans nigra	Black Walnut	7	3	Good	Good form and vigour.
1121	Syringa reticulata	Japanese Lilac	12	3	Good	Good form and vigour.
1122	Acer platanoides	Norway Maple	21	5	Good	Good form and vigour.
1123	Syringa reticulata	Japanese Lilac	13	3	Good	Good form and vigour.
1124	Syringa reticulata	Japanese Lilac	9	3	Good	Good form and vigour.
1125	Juglans nigra	Black Walnut	23	7	Fair-Good	Good form and vigour.
1126	Acer platanoides	Norway Maple	20	4	Fair-Good	Suppressed on west side of tree by neighbouring tree; Tree leaning towards the east.
1127	Acer platanoides	Norway Maple	14	4	Good	Good form and vigour.
1128	Juglans nigra	Black Walnut	3	1	Fair-Good	Tree leaning towards the east.
1129	Prunus serotina	Black Cherry	6	1	Good	Good vigour; Slight lean towards the east.
1130	Prunus serotina	Black Cherry	3	1	Good	Good vigour; Growing through wood fence.
1131	Picea glauca	White Spruce	27, 25	6	Good	Stems fork below breast height; Good form and vigour.
1132	Picea glauca	White Spruce	17	3	Fair-Good	Suppressed on south side of tree by neighbouring tree; Good vigour.
1133	Acer negundo	Manitoba Maple	69	10	Good	Stems fork into two just above breast height; Good vigour; Branches adjacent to and partially within utility lines.
1134	Picea abies	Norway Spruce	35	6	Fair-Good	Good vigour; Branches pruned in past adjacent to utility pole.
1135	Acer negundo	Manitoba Maple	64, 15, 15	6	Fair	Moderate dieback and thinning; Stems fork near ground.
1136	Acer negundo	Manitoba Maple	51, 43, 29, 55	10	Fair	Moderate dieback and thinning; Stems fork below breast height; Included bark at stem union.
1137	Juglans nigra	Black Walnut	15	3	Good	Good form and vigour.
1138	Juglans nigra	Black Walnut	13	4	Fair-Good	Good form and vigour.
1139	Juglans nigra	Black Walnut	22	6	Good	Good form and vigour.
1140	Juglans nigra	Black Walnut	24	6	Good	Good form and vigour.
1141	Juglans nigra	Black Walnut	4	1	Fair-Good	Good form and vigour.
1142	Picea abies	Norway Spruce	54	8	Fair-Good	Good form and vigour.
1143	Thuja occidentalis	Eastern White Cedar	23	3	Good	Good form and vigour.
1144	Thuja occidentalis	Eastern White Cedar	21	3	Good	Good form and vigour.
1145	Acer platanoides	Norway Maple	18	3	Fair-Good	Relatively small crown.
1146	Picea abies	Norway Spruce	48	7	Fair-Good	Minor dieback due to overcrowding.
1147	Picea abies	Norway Spruce	45	6	Fair-Good	Minor dieback due to overcrowding.
1148	Picea abies	Norway Spruce	24	7	Fair-Good	Minor dieback due to overcrowding.
1149	Picea abies	Norway Spruce	27	5	Fair-Good	Minor dieback due to overcrowding.
1150	Picea abies	Norway Spruce	30	7	Fair-Good	Minor dieback due to overcrowding.
1151	Picea abies	Norway Spruce	42	7	Fair-Good	Minor dieback due to overcrowding.
1152	Picea abies	Norway Spruce	51	7	Fair-Good	Minor dieback due to overcrowding.
1153	Picea abies	Norway Spruce	27	5	Fair-Good	Minor dieback due to overcrowding.
1154	Picea abies	Norway Spruce	16	5	Fair-Good	Minor dieback due to overcrowding.
1155	Picea abies	Norway Spruce	39	6	Fair-Good	Minor dieback due to overcrowding.
1156	Picea abies	Norway Spruce	23	6	Fair-Good	Minor dieback due to overcrowding.
1157	Picea abies	Norway Spruce	48	7	Fair-Good	Minor dieback due to overcrowding.
1158	Picea abies	Norway Spruce	41	7	Fair-Good	Minor dieback due to overcrowding.
1159	Picea abies	Norway Spruce	35	7	Fair-Good	Minor dieback due to overcrowding.
1160	Picea abies	Norway Spruce	53, 22	8	Fair-Good	Minor dieback due to overcrowding; Stems fork at ground.
1161	Picea abies	Norway Spruce	28	5	Fair-Good	Minor dieback due to overcrowding.
1162	Picea abies	Norway Spruce	38	7	Fair-Good	Minor dieback due to overcrowding.
1165	Picea abies	Norway Spruce	22	5	Fair-Good	Minor dieback due to overcrowding.
1166	Picea abies	Norway Spruce	40	7	Fair-Good	Minor dieback due to overcrowding.
1167	Picea abies	Norway Spruce	21	4	Fair-Good	Minor dieback due to overcrowding.
1168	Picea abies	Norway Spruce	47	7	Fair-Good	Minor dieback due to overcrowding.
1169	Picea abies	Norway Spruce	23	4	Fair-Good	Minor dieback due to overcrowding.
1170	Picea abies	Norway Spruce	27	4	Fair-Good	Minor dieback due to overcrowding.
1171	Picea abies	Norway Spruce	46	6	Fair-Good	Minor dieback due to overcrowding.
1172	Quercus rubra	Red Oak	22	8	Good	Good form and vigour; Tree located offsite on adjacent private property; DBH approximate as trunk not accessible
1173	Fraxinus americana	White Ash	4, 2	1	Good	Good vigour.
1174	Fraxinus americana	White Ash	3, 2	1	Good	
1175	Fraxinus americana	White Ash	6	1	Good	
1176	Malus sp.	Crabapple	21, 14, 10	6	Fair-Good	Stems fork near ground; Minor dieback and thinning.
1177	Malus sp.	Crabapple	12, 18, 10, 8, 7	6	Fair	Moderate dieback and thinning; Dead branches; Stems fork near ground..
1178	Acer platanoides	Norway Maple	24	6	Good	Good vigour; Suppressed on north side of tree by neighbouring tree.
1179	Acer platanoides	Norway Maple	38	8	Good	Good form and vigour.
1180	Acer platanoides	Norway Maple	33	6	Good	Good form and vigour.
1181	Quercus rubra	Red Oak	6	1	Good	Good form and vigour.
1182	Pinus nigra	Austrian Pine	35	7	Fair-Good	Good vigour; Leader cut or snapped in past.
1183	Acer platanoides	Norway Maple	35	7	Good	Good form and vigour.
1184	Acer platanoides	Norway Maple	28	6	Fair-Good	Good vigour; Relatively small rotting cavity approximately 2 m from ground.
1185	Acer platanoides	Norway Maple	31	6	Fair-Good	Rotting cavity just above crotch; Good vigour.
1186	Quercus rubra	Red Oak	8	2	Good	Good form and vigour.
1187	Picea pungens	Colorado Blue Spruce	8	2	Good	Good form and vigour.
1188	Quercus rubra	Red Oak	9	3	Good	Good form and vigour.
1189	Gleditsia triacanthos var inermis	Thornless Honeylocust	34	7	Good	Good form and vigour; Two pruned lateral branches.
1190	Acer platanoides	Norway Maple	22	6	Good	Good form and vigour.
1191	Quercus rubra	Red Oak	9	3	Good	Good form and vigour.
1192	Acer platanoides	Norway Maple	22	6	Good	Good form and vigour.
1193	Gleditsia triacanthos var inermis	Thornless Honeylocust	32	10	Good	Good form and vigour.
1194	Pinus sylvestris	Scots Pine	24	4	Good	Crown raised; Good vigour.
1195	Pinus nigra	Austrian Pine	25	5	Fair-Good	Corrected lean; Good vigour.
1196	Pinus sylvestris	Scots Pine	23	5	Good	Good form and vigour.
1197	Acer negundo	Manitoba Maple	22, 20	4	Fair-Good	Minor dieback and thinning; Stems fork near ground.
1198	Acer negundo	Manitoba Maple	7	2	Fair-Good	Good vigour; Leaning towards the east.
1199	Acer platanoides	Norway Maple	7	2	Good	Good form and vigour.
1200	Acer negundo	Manitoba Maple	6, 6	3	Fair-Good	Good vigour; Stems leaning towards the south.
1201	Acer platanoides	Norway Maple	6	2	Good	Good form and vigour.
1202	Acer negundo	Manitoba Maple	11	3	Fair-Good	Tree leaning towards the north.
1203	Picea abies	Norway Spruce	75	8	Good	Good form and vigour.
1204	Acer platanoides	Norway Maple	7	2	Fair-Good	Immediately adjacent to large Norway Spruce.
1205	Acer platanoides	Norway Maple	4	2	Good	Good form and vigour.
1206	Acer platanoides	Norway Maple	12	3	Good	Good form and vigour.
1207	Fraxinus americana	White Ash	2	1	Good	Good form and vigour.
1208	Fraxinus americana	White Ash	4	1	Good	Good vigour; Leaning towards the south.
1209	Fraxinus americana	White Ash	4	1	Good	Good form and vigour.
1210	Fraxinus americana	White Ash	6	2	Good	Good form and vigour.
1211	Acer saccharum	Sugar Maple	6	2	Good	Good form and vigour.
1212	Fraxinus americana	White Ash	8	2	Good	Good form and vigour.
1213	Acer negundo	Manitoba Maple	3	1	Good	Good form and vigour.
1214	Acer negundo	Manitoba Maple	6, 5, 5	3	Fair-Good	Some adventitious shoots from base of tree; Stems fork below breast height.
1215	Fraxinus americana	White Ash	31	NA	Dead	Dead as a result of infestation from EAB; Potential risk tree.
1216	Fraxinus americana	White Ash	19	NA	Dead	Dead as a result of infestation from EAB; Potential risk tree.
1217	Fraxinus excelsior	European Ash	96	16	Fair	Moderate dieback and thinning; No apparent evidence of EAB damage.
1218	Acer negundo	Manitoba Maple	9, 4, 4	3	Good	Good vigour; Stems fork near ground.
1219	Picea pungens	Colorado Blue Spruce	25	6	Good	Good form and vigour.
1220	Acer platanoides	Norway Maple	24	7	Good	Good form and vigour.
1221	Acer negundo	Manitoba Maple	31	9	Good	Good vigour; Stems fork into two at breast height.
1222	Fraxinus excelsior	European Ash	27	7	Fair-Good	Uneven crown; Suppressed on north side of tree by neighbouring trees.
1223	Fraxinus pennsylvanica	Green Ash	10	3	Fair	Tree declining in health likely due to EAB.
1224	Picea abies	Norway Spruce	68	12	Good	Good form and vigour.
1225	Juglans nigra	Black Walnut	9	3	Good	Good vigour; Stems bends approximately 3 m from groundl
1226	Salix alba	White Willow	40, 23	10	Fair-Good	Stems fork near ground; Smaller stem leaning towards the west; Uneven crown.
1227	Acer negundo	Manitoba Maple	8	2	Poor	Significant dieback and thinning; Growing into fence.
1228	Juglans nigra	Black Walnut	3	1	Good	Good form and vigour.
1229	Acer negundo	Manitoba Maple	18	2	Poor	Tree almost dead and growing through fence.
1230	Fraxinus americana	White Ash	5, 4, 4, 4, 3	2	Good	Stems fork at ground.
1231	Fraxinus americana	White Ash	3, 2, 1	1	Fair-Good	Stems fork near ground.
1232	Acer negundo	Manitoba Maple	30, 11	5	Fair-Good	Stems fork near ground.
1233	Acer negundo	Manitoba Maple	12	2	Fair	Relatively small crown; Moderate dieback.
1234	Ulmus americana	American Elm	25	2	Fair	Very small crown; Moderate dieback.
1235	Acer negundo	Manitoba Maple	25, 15, 18, 17	5	Fair	Stems fork near ground; DBH approximate as trunk not accessible.
1236	Acer negundo	Manitoba Maple	21	4	Fair-Good	DBH approximate as trunk not accessible; Minor dieback; Uneven crown.
1237	Fraxinus americana	White Ash	6, 6, 5	4	Good	Good vigour; Stems fork at ground.
1238	Acer negundo	Manitoba Maple	26, 12, 14	5	Fair-Good	Minor dieback; Largest stem growing through fence.
1239	Acer negundo	Manitoba Maple	25, 25, 10	5	Poor-Fair	Stems growing through fence; Fungal damage to stems; Tree declining in health.
1240	Fraxinus americana	White Ash	8	2	Fair-Good	Minor dieback.
1241	Acer negundo	Manitoba Maple	23, 23, 23, 25	6	Fair-Good	Stems fork near ground and growing through fence; Minor dieback and thinning.
1242	Acer negundo	Manitoba Maple	10	2	Fair	Moderate dieback; DBH approximate as trunk not accessible.
1243	Fraxinus americana	White Ash	5, 5, 4, 4, 4, 4	2	Good	Stems fork at ground from stump.
1244	Acer negundo	Manitoba Maple	27, 17, 24, 14	5	Fair	Moderate dieback and thinning; DBH approximate as trunk not accessible.
1245	Acer negundo	Manitoba Maple	16, 16	5	Fair	Moderate dieback and thinning; One of two stems growing through fence.
1246	Acer negundo	Manitoba Maple	21, 20, 11	5	Fair	Moderate dieback and thinning; Growing through fence.
1247	Acer negundo	Manitoba Maple	17, 6	4	Fair-Good	Minor dieback and thinning.
1248	Acer negundo	Manitoba Maple	19	3	Fair-Good	Relatively small crown.
1249	Acer negundo	Manitoba Maple	15	4	Fair	Moderate dieback and thinning.
1250	Acer negundo	Manitoba Maple	6, 6	4	Good	Stems fork near ground; Good vigour.
1251	Acer negundo	Manitoba Maple	13, 11	4	Fair-Good	Stems leaning towards the east.
1252	Acer negundo	Manitoba Maple	17, 11	4	Fair	Smaller stem almost dead.
1253	Acer negundo	Manitoba Maple	11	4	Fair-Good	Stem leaning towards the east.
1254	Acer negundo	Manitoba Maple	10	2	Fair-Good	Relatively small crown; Stem growing into fence.
1255	Acer negundo	Manitoba Maple	15, 7, 7	4	Fair-Good	Stems fork at ground.
1256	Acer negundo	Manitoba Maple	11 5, 8	2	Poor-Fair	Tree declining in health; Smaller stems are all dead.
1257	Acer negundo	Manitoba Maple	8, 5	4	Fair-Good	Stems leaning towards the east.
1258	Acer negundo	Manitoba Maple	16	4	Fair-Good	Minor dieback; Growing into fence.
1259	Acer negundo	Manitoba Maple	14	3	Fair-Good	Minor dieback and thinning; Stem growing into fence.
1260	Acer negundo	Manitoba Maple	15	3	Fair-Good	Minor dieback and thinning.
1261	Acer negundo	Manitoba Maple	18, 6, 11	4	Fair-Good	Minor dieback and thinning.
1262	Acer negundo	Manitoba Maple	10	3	Fair-Good	Tree leaning towards the east.
1263	Acer negundo	Manitoba Maple	23	5	Fair-Good	Stem growing into fence.
1264	Acer negundo	Manitoba Maple	10	3	Fair-Good	Stem leaning towards the east.
1265	Acer negundo	Manitoba Maple	15, 7	4	Fair-Good	Minor dieback and thinning.
1266	Acer negundo	Manitoba Maple	7	NA	Good	Dead stem.
1267	Acer negundo	Manitoba Maple	18, 14	4	Fair-Good	Minor dieback and thinning.
1268	Acer negundo	Manitoba Maple	8	3	Poor	Tree almost dead; Leaning towards the east.
1269	Acer negundo	Manitoba Maple	6	2	Fair	Moderate dieback and thinning.
1270	Acer negundo	Manitoba Maple	7	2	Poor-Fair	Tree declining in health; Leaning towards the east.
1271	Acer negundo	Manitoba Maple	10, 12, 9	4	Fair	Moderate dieback and thinning.
1272	Acer negundo	Manitoba Maple	15, 11	5	Fair-Good	Minor dieback and thinning.
1273	Acer negundo	Manitoba Maple	19	5	Good	Good form and vigour.
1274	Acer negundo	Manitoba Maple	15, 13	5	Fair	Moderate dieback and thinning.
1275	Acer negundo	Manitoba Maple	11, 7	7	Fair-Good	Minor dieback and thinning.
1276	Acer negundo	Manitoba Maple	27	5	Good	Good form and vigour.
1277	Acer negundo	Manitoba Maple	16	5	Fair-Good	Minor dieback; Slightly leaning towards the east.
1278	Acer negundo	Manitoba Maple	13,13	NA	Dead	Standing snag.
1279	Acer negundo	Manitoba Maple	14, 10, 8, 7	6	Fair	Moderate dieback and thinning; Stems fork near ground.
1280	Acer negundo	Manitoba Maple	14, 13, 13	2	Poor	Tree almost dead; Minor epicormic growth at base of tree; Potential risk tree.
1281	Juglans nigra	Black Walnut	35	8	Good	Good form and vigour.
1282	Acer platanoides	Norway Maple	29	5	Fair-Good	Minor dieback due to overcrowding.
1283	Acer saccharum	Sugar Maple	21, 25	6	Good	Relatively small crown; Stems fork below breast height; Included bark at stem union.
1284	Thuja occidentalis	Eastern White Cedar	9, 5, 2	2	Fair-Good	Stems fork near ground.
1285	Acer platanoides	Norway Maple	23	5	Fair-Good	Minor dieback and thinning due to overcrowding.
1286	Thuja occidentalis	Eastern White Cedar	11	3	Good	Good form and vigour.
1287	Thuja occidentalis	Eastern White Cedar	17, 6	4	Good	Good form and vigour; Stems fork near ground.
1288	Thuja occidentalis	Eastern White Cedar	14	4	Good	Good form and vigour.
1289	Picea abies	Norway Spruce	72	10	Good	Good form and vigour.
1290	Picea abies	Norway Spruce	57	10	Good	Good form and vigour.
1291	Thuja occidentalis	Eastern White Cedar	13	4	Good	Good form and vigour .
1292	Thuja occidentalis	Eastern White Cedar	17	4	Good	Good form and vigour .
1293	Thuja occidentalis	Eastern White Cedar	15	4	Good	Good form and vigour .
1294	Thuja occidentalis	Eastern White Cedar	17	4	Good	Good form and vigour .
1295	Thuja occidentalis	Eastern White Cedar	13, 8	4	Good	Good form and vigour .
1296	Thuja occidentalis	Eastern White Cedar	8	3	Good	Good form and vigour .
1297	Thuja occidentalis	Eastern White Cedar	13	4	Good	Good form and vigour .
1298	Thuja occidentalis	Eastern White Cedar	9	3	Good	Good form and vigour .
1299	Thuja occidentalis	Eastern White Cedar	12	4	Good	Good form and vigour .
1300	Thuja occidentalis	Eastern White Cedar	11	4	Good	Good form and vigour .
1301	Thuja occidentalis	Eastern White Cedar	6	3	Good	Good form and vigour .
1302	Thuja occidentalis	Eastern White Cedar	5	3	Good	Good form and vigour .
1303	Thuja occidentalis	Eastern White Cedar	12	3	Good	Good form and vigour .
1304	Acer platanoides	Norway Maple	9, 8, 8, 6	4	Good	Good vigour; Stems fork at ground.
1305	Acer platanoides	Norway Maple	5	2	Good	Stem growing from base of adjacent White Cedar; Growing through fence.
1306	Juniperus virginiana	Red Cedar	19, 10, 12	5	Fair	Moderate dieback and thinning; Stems fork below breast height; Some chlorosis of needles.
1307	Acer platanoides	Norway Maple	2	1	Good	Good vigour; Growing from base of adjacent Red Cedar.
1308	Morus alba	White Mulberry	38, 35, 22	11	Fair-Good	Minor dieback and thinning; Some dead lower lateral branches.
1309	Juniperus virginiana	Red Cedar	23, 15, 15	6	Good	Good vigour; Stems fork below breast height.
1310	Acer platanoides	Norway Maple	31, 25	12	Fair-Good	Minor dieback of interior branches; Minor insect damage to trunk and branches.
1311	Acer platanoides	Norway Maple	22, 15	7	Poor-Fair	Tree declining in health; Significant dieback and thinning; Many dead interior branches and hangars.
1312	Acer negundo	Manitoba Maple	13	4	Good	Stem leaning significantly towards the southeast.
1313	Acer negundo	Manitoba Maple	25	8	Fair-Good	Stem leaning significantly towards the southeast; Epicormic shoots at base of tree.
1314	Acer negundo	Manitoba Maple	10	4	Good	Good vigour; Slight lean towards the southwest.
1315	Thuja occidentalis	Eastern White Cedar	19	NA	Dead	Standing snag; Potential risk tree.
1316	Thuja occidentalis	Eastern White Cedar	20	4	Fair	Moderate dieback and thinning; Slight lean towards the southeast.
1317	Pinus nigra	Austrian Pine	62	15	Good	Good vigour; Stems fork into two above breast height; Included bark at stem union; Crown raised.
1318	Pinus nigra	Austrian Pine	67	16	Good	Good form and vigour.
1319	Pinus sylvestris	Scots Pine	29	5	Fair-Good	Relatively small crown; Suppressed on north side of tree by neighbouring trees.
1320	Thuja occidentalis	Eastern White Cedar	16	4	Good	Tree leaning slightly towards the south; Immediately adjacent to flagstone walll
1321	Thuja occidentalis	Eastern White Cedar	18	4	Good	Tree leaning slightly towards the south; Immediately adjacent to flagstone walll
1322	Picea glauca	White Spruce	15	3	Fair-Good	Stem bending towards the south approximately 5 m from the ground.
1323	Thuja occidentalis	Eastern White Cedar	16	4	Good	Good form and vigour.
1324	Thuja occidentalis	Eastern White Cedar	23	4	Good	Good form and vigour.
1325	Thuja occidentalis	Eastern White Cedar	19	5	Good	Good form and vigour.
1326	Thuja occidentalis	Eastern White Cedar	60	7	Good	Good form and vigour.
1327	Thuja occidentalis	Eastern White Cedar	15, 20, 27, 27, 29	7	Fair-Good	Minor dieback; 20 cm stem dead.
1328	Thuja occidentalis	Eastern White Cedar	29	5	Fair-Good	Stem leaning slightly towards the southwest; Fence post clamped to tree trunk.
1329	Thuja occidentalis	Eastern White Cedar	37, 22, 24, 40	9	Fair	Stems fork at ground; Moderate dieback and thinning; Some cavities approximately 2 m from ground.
1330	Thuja occidentalis	Eastern White Cedar	17	NA	Dead	Standing sna; Potential risk tree.
1331	Thuja occidentalis	Eastern White Cedar	17, 18	5	Fair	Moderate dieback and thinning; Stems fork at ground..
1332	Acer platanoides	Norway Maple	19	5	Good	Good form and vigour.
1333	Acer platanoides	Norway Maple	10	4	Good	Good form and vigour.
1334	Acer platanoides	Norway Maple	9, 7	3	Good	Good vigour; Stems fork near ground.
1335	Acer platanoides	Norway Maple	5	1	Good	Good form and vigour.
1336	Acer platanoides	Norway Maple	19	NA	Dead	Standing snag; Potential risk tree.
1337	Tilia americana	Basswood	19, 20, 6, 4	5	Fair	Stems fork near ground; Moderate dieback and thinning.
1338	Tilia americana	Basswood	14	NA	Dead	Standing snag; Potential risk tree.
1339	Acer platanoides	Norway Maple	6	3	Good	Good form and vigour.
1340	Acer platanoides	Norway Maple	23	5	Good	Good vigour; Suppressed on north side of tree by neighbouring trees.
1341	Pinus sylvestris	Scots Pine	27	6	Fair-Good	Minor dieback; Crown limited to very top of tree.
1342	Acer platanoides	Norway Maple	10	4	Good	Good form and vigour.
1343	Acer platanoides	Norway Maple	27	8	Good	Good form and vigour.
1344	Acer platanoides	Norway Maple	23	7	Fair-Good	Minor dieback and thinning; Corrected lean.
1345	Acer platanoides	Norway Maple	25	8	Good	Good vigour; Corrected lean.
1346	Acer platanoides	Norway Maple	22	NA	Dead	Standing snag; Potential risk tree.
1347	Acer platanoides	Norway Maple	8	2	Good	Slight lean towards the south.
1348	Acer platanoides	Norway Maple	7	2	Good	Slight lean towards the south.
1349	Acer negundo	Manitoba Maple	7	3	Good	Good form and vigour.
1350	Acer negundo	Manitoba Maple	3	1	Good	Good form and vigour.
1351	Acer negundo	Manitoba Maple	3, 3, 3	1	Fair-Good	Minor dieback.
1352	Acer negundo	Manitoba Maple	2	1	Good	Good form and vigour.
1353	Acer negundo	Manitoba Maple	5, 4, 3	2	Good	Stems fork near ground.
1354	Acer negundo	Manitoba Maple	8, 8, 8	3	Good	Good vigour; Stems fork near ground.
1355	Acer negundo	Manitoba Maple	5, 5, 3	3	Good	Stems fork near ground.
1356	Acer negundo	Manitoba Maple	3	1	Good	Good form and vigour.
1357	Acer negundo	Manitoba Maple	7, 7, 6, 8, 8	3	Good	Good vigour; Stems fork near ground.
1358	Acer platanoides	Norway Maple	34	8	Good	Good form and vigour.
1359	Acer platanoides	Norway Maple	70	10	Fair-Good	Full even crown; Large section of bark lifting from south side of trunk.
1360	Acer platanoides	Norway Maple	39	8	Good	Irregular crown; Minor insect damage to trunk.
1361	Acer saccharum	Sugar Maple	54	10	Good	Good form and vigour.
1362	Acer saccharum	Sugar Maple	47	10	Good	Good form and vigour.
1363	Acer platanoides	Norway Maple	20	6	Fair	Vertical crack along length of trunk; Moderate dieback and dead branches; Missing barkmon north side of tree.
8917	Salix x sepulcralis	Weeping Willow	82	12	Fair	Moderate dieback and thinning.
8918	Salix x sepulcralis	Weeping Willow	79	12	Fair	Moderate dieback and thinning; Some bracket fungi on branches.
8919	Salix x sepulcralis	Weeping Willow	62	14	Fair	Moderate dieback and thinning.
8920	Salix x sepulcralis	Weeping Willow	81	12	Fair	Moderate dieback and thinning; Portions of stem with lifted or missing bark.
8921	Salix x sepulcralis	Weeping Willow	72	12	Fair	Moderate dieback and thinning.
8922	Salix x sepulcralis	Weeping Willow	62	12	Fair	Moderate dieback and thinning.
8923	Salix x sepulcralis	Weeping Willow	75	12	Fair	Moderate dieback and thinning.
8924	Salix x sepulcralis	Weeping Willow	67	14	Fair-Good	Minor dieback and thinning.
8925	Salix x sepulcralis	Weeping Willow	57	12	Fair-Good	Moderate dieback and thinning; Epicormic growth along trunk.
8926	Salix x sepulcralis	Weeping Willow	49	12	Fair-Good	Minor dieback and thinning.
8927	Salix x sepulcralis	Weeping Willow	56	14	Fair	Moderate dieback and thinning; Some snapped branches.
8928	Salix x sepulcralis	Weeping Willow	52	11	Fair-Good	Moderate dieback and thinning.
8929	Salix x sepulcralis	Weeping Willow	59	12	Fair	Moderate dieback and thinning; Adventitious shoots on top side of branches.
8930	Salix x sepulcralis	Weeping Willow	52	12	Fair	Moderate dieback and thinning.
8931	Salix x sepulcralis	Weeping Willow	76	10	Fair	Originally two stemmed with second stem snapped and removed; Moderate dieback.
BN1	Juglans cinerea	Butternut	14	2	Fair	Leaves have not emerged; Some sooty and open canker in stem and trunk flare.
BN2	Juglans cinerea	Butternut	34	10	Fair	Moderate dieback and thinning; Dead branches; Open cankers and sooty on trunk and trunk flare.
NT2	Acer negundo	Manitoba Maple	9, 8, 6, 5	4	Good	Stems fork at ground; Not tagged as tree accessible
NT3	Picea abies	Norway Spruce	40	7	Fair-Good	Minor dieback and thinning; DBH approximate as trunk not accessible; Fenced off.
NT4	Fraxinus pennsylvanica	Green Ash	15	4	Fair-Good	Minor dieback and no apparent damage from EAB.
NT5	Picea abies	Norway Spruce	30	4	Poor	Significant dieback and thinning; DBH approximate as tree trunk not accessible.
NT6	Picea abies	Norway Spruce	45	8	Fair-Good	Minor dieback and thinning due to overcrowding; DBH approximate as tree trunk not accessible.
NT7	Picea glauca	White Spruce	35	8	Good	DBH approximate as trunk not accessible; Good form and vigour.
NT8	Picea glauca	White Spruce	25	8	Good	DBH approximate as trunk not accessible; Good vigour and form.
NT9	Acer saccharum	Sugar Maple	54	10	Fair-Good	Minor dieback and thinning; Some insect damage to trunk and branches.
NT10	Salix x sepulcralis	Weeping Willow	36	7	Poor-Fair	Tree declining in health; One live stem.
NT11	Acer saccharum	Sugar Maple	79	10	Poor-Fair	Tree declining in health; Uneven crown with load on west side of tree; Large rotting cavity approximately 1.5 m from ground; Potential risk tree.
NT12	Picea abies	Norway Spruce	57	8	Fair	Chlorosis of needles; Roots entirely covered by pavement.
NT13	Fraxinus pennsylvanica	Green Ash	22, 12	8	Poor	Almost dead as a result of infestation from EAB; Potential risk tree.
OS71	Acer platanoides	Norway Maple	59	12	Good	Good form and vigour; Tree offsite on adjacent private property.
OS72	Acer platanoides	Norway Maple	72	12	Fair-Good	Minor dieback; Vertical crackmalongbtrunk; Tree offsite on adjacent private property; Existing tag no. 31.
OS73	Gleditsia triacanthos var inermis	Thornless Honeylocust	65	12	Good	Good form and vigour; Located offsite on adjacent private property.
OS74	Acer negundo	Manitoba Maple	79	24	Fair-Good	Minor dieback and thinning; Branches overextended.
OS75	Acer negundo	Manitoba Maple	25	10	Fair	Moderate dieback and thinning; Tree leaning towards the south into ROW.
OS76	Thuja occidentalis	Eastern White Cedar	29	4	Poor-Fair	Tree declining in health; ~ 50% canopy remaining.
OS77	Acer negundo	Manitoba Maple	54	12	Fair	Moderate dieback and thinning; Tree leaning towards the south.
OS78	Acer negundo	Manitoba Maple	27, 10, 9, 3, 10	10	Fair-Good	Stems fork near ground; Minor dieback and thinning.
OS79	Acer saccharinum	Silver Maple	48, 45, 48, 50	20	Good	Stems fork below breast height; Good form and vigour.
OS80	Malus sp.	Apple	29	8	Fair-Good	Good vigour; Some epicormic growth near base of tree.
OS81	Juglans nigra	Black Walnut	35	14	Good	Good form and vigour.
OS82	Acer x freemanii	Freeman's Maple	41	10	Good	Good form and vigour; Included bark at stem union.
OS83	Acer x freemanii	Freeman's Maple	33	10	Good	Good form and vigour; Stems fork just above breast height.
OS84	Acer x freemanii	Freeman's Maple	42	10	Good	Good form and vigour.
OS85	Acer x freemanii	Freeman's Maple	42	10	Good	Good form and vigour.
OS86	Acer x freemanii	Freeman's Maple	49	12	Good	Good form and vigour.
OS87	Acer x freemanii	Freeman's Maple	53	12	Good	Good form and vigour.
OS88	Acer x freemanii	Freeman's Maple	49	12	Good	Good form and vigour.
OS89	Acer x freemanii	Freeman's Maple	53	12	Good	Good form and vigour.
OS90	Acer x freemanii	Freeman's Maple	54	10	Good	Good form and vigour.
OS91	Acer saccharum	Sugar Maple	17	6	Fair-Good	Good form and vigour; Located offsite on adjacent private property.
OS92	Acer platanoides	Norway Maple	57	10	Good	Good vigour; Stems pruned in past to accommodate utility lines.
OS93	Juglans nigra	Black Walnut	86	10	Fair	Moderate dieback and thinning; Adventitious shoots on top side of branches; Pruned in past to accommodate utility lines.
OS94	Pinus nigra	Austrian Pine	41	6	Good	Good vigour; Crown raised.
OS95	Pinus nigra	Austrian Pine	38	6	Good	Good form and vigour; Crown raised.
OS96	Pinus nigra	Austrian Pine	36	7	Fair-Good	Minor dieback and thinning; Corrected lean.
OS97	Pinus nigra	Austrian Pine	29	7	Good	Good form and vigour.
OS98	Aesculus hippocastanum	Horsechestnut	20, 19, 17	7	Fair-Good	Minor dieback and thinning; Stems fork near ground.
OS99	Acer negundo	Manitoba Maple	60	12	Fair	Moderate dieback and thinning; Tree leaning significantly towards the west; Epicormic shoots on trunk.
OS100	Thuja occidentalis	Eastern White Cedar	37	6	Fair-Good	Minor dieback and thinning; Tree leaning towards the south.
OS101	Thuja occidentalis	Eastern White Cedar	25, 20	5	Fair	Stems fork just below breast height; Stems breaking apart; Moderate dieback and thinning.
OS102	Thuja occidentalis	Eastern White Cedar	19, 17	4	Poor	Stems fork near ground; Chlorosis of majority of needles within crown.
OS103	Acer negundo	Manitoba Maple	82	16	Fair	Moderate dieback and thinning; Epicormic shoots at base of tree.
OS104	Acer negundo	Manitoba Maple	60	17	Fair-Good	Minor dieback and thinning; Epicormic shoots pruned at base of tree.
OS105	Acer negundo	Manitoba Maple	20	5	Fair-Good	Minor dieback and thinning; DBH approximate as trunk not accessible.
OS106	Acer negundo	Manitoba Maple	15, 14, 14, 10	6	Fair-Good	Minor dieback and thinning; DBH approximate as trunk not accessible.
OS107	Acer negundo	Manitoba Maple	14	4	Fair-Good	Minor dieback and thinning; DBH approximate as trunk not accessible.
OS108	Acer negundo	Manitoba Maple	27	6	Fair-Good	Minor dieback and thinning; DBH approximate as trunk not accessible.
OS109	Acer negundo	Manitoba Maple	25, 12, 11	5	Fair-Good	Minor dieback and thinning; DBH approximate as trunk not accessible.
OS110	Acer negundo	Manitoba Maple	7, 5, 7	4	Fair-Good	Minor dieback and thinning; DBH approximate as trunk not accessible.
OS111	Acer negundo	Manitoba Maple	20	5	Fair-Good	Minor dieback and thinning; DBH approximate as trunk not accessible.
OS112	Acer negundo	Manitoba Maple	20, 25, 22	5	Fair-Good	Minor dieback and thinning; DBH approximate as trunk not accessible.
OS113	Acer platanoides	Norway Maple	55	14	Good	Tree located offsite on adjacent private property; DBH approximate as trunk not accessible.
OS114	Acer saccharum	Sugar Maple	60	10	Fair	Moderate dieback and thinning; DBH approximate as trunk not accessible.
OS115	Acer saccharum	Sugar Maple	60	14	Good	Good form and vigour; DBH approximate as trunk not accessible.
OS116	Acer platanoides	Norway Maple	12, 7	4	Good	Good vigour; Stems fork near ground.
OS117	Thuja occidentalis	Eastern White Cedar	14, 12	4	Good	Good form and vigour; DBH approximate as trunk not accessible.
OS118	Thuja occidentalis	Eastern White Cedar	14, 13, 12	4	Good	Good form and vigour; DBH approximate as trunk not accessible.
OS119	Thuja occidentalis	Eastern White Cedar	20, 19, 15	5	Good	Good form and vigour; DBH approximate as trunk not accessible.
OS120	Thuja occidentalis	Eastern White Cedar	20, 15	5	Good	Good form and vigour; DBH approximate as trunk not accessible.
OS121	Thuja occidentalis	Eastern White Cedar	17, 17, 15	5	Good	Good form and vigour; DBH approximate as trunk not accessible.
OS122	Thuja occidentalis	Eastern White Cedar	19, 17, 12	5	Good	Good form and vigour; DBH approximate as trunk not accessible.
OS123	Picea pungens	Colorado Blue Spruce	28	5	Good	Good form and vigour; DBH approximate as trunk not accessible.
OS124	Acer negundo	Manitoba Maple	34	12	Fair-Good	Tree leaning significantly towards the southeast; Epicormic shoots at base of tree.
OS125	Acer negundo	Manitoba Maple	4, 6	2	Fair-Good	Minor dieback; Stems fork at ground; Tree leaning towards the southeast.
OS126	Acer negundo	Manitoba Maple	8	2	Fair-Good	Minor dieback and thinning; Slight lean towards the southwest.
OS127	Pinus sylvestris	Scots Pine	21	4	Fair	Uneven crown with all live branches on south side of tree.
OS128	Pinus nigra	Austrian Pine	60	14	Good	Good form and vigour; DBH approximate as trunk located on adjacent private property.
OS129	Acer platanoides	Norway Maple	37	12	Good	Good form and vigour.
OS130	Acer platanoides	Norway Maple	11	4	Good	Good vigour; Stem gradually bending towards the south.
OS131	Pinus sylvestris	Scots Pine	36	5	Good	Crown limited to very top of tree.
OS132	Juglans nigra	Black Walnut	28	10	Good	Good vigour; Under utility lines; Partially smothered by grapevines.
OS133	Gleditsia triacanthos var inermis	Thornless Honeylocust	22, 22	6	Good	Good form and vigour; Included bark at stem union .
OS134	Acer negundo	Manitoba Maple	8, 3	2	Good	Good vigour; Stems fork near ground.
OS135	Acer negundo	Manitoba Maple	7, 6, 5, 4, 4, 3, 2	3	Fair-Good	Stems fork near ground; Minor dieback and thinning.

1. The tree health condition rating was based on factors that could include one or a combination of:
   - Poor Condition – Severe dieback, significant lean, decayed, missing leader, significant disease presence
   - Fair Condition – Moderate dieback and/or lean, limb defects, multiple stems, moderate foliage damage from stress
   - Good Condition – Healthy vigorous growth, no or minor visible defects or damage
   - Very Good Condition – Healthy vigorous growth, no visible defects or damage

LEGEND

Notes: Scale shown is for an 36" x 24" page.
For illustrative purposes. Do not scale

Nº	REVISIONS	DATE:	BY:
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5			
4			
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1	COMMENT	xxxx/xx/xx	xx

SCALE

NORTH ARROW

CERTIFIED ARBORIST ISA ®
SEVAN TORUS
#ON-1924A

BEACON ENVIRONMENTAL

CLIENT
REGIONAL MUNICIPALITY OF YORK

PROJECT
KENNEDY ROAD
TREE INVENTORY

SHEET TITLE
TREE INVENTORY

DESIGN BY:	--	PROJECT Nº:	220329
DRAWN BY:	AD	FIGURE Nº:	TP-10
CHECKED BY:	ST		
DATE:	25 April 2021		

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[THE DIFFERENCE IS OUR PEOPLE]

Technical Memorandum
Existing Natural Features

Date: April 11, 2023 **Project No.:** 300052314.0000

Project Name: Warden Avenue and Kennedy Road Environmental Assessment Studies Between Major Mackenzie Drive and Elgin Mills Road

Client Name: Regional Municipality of York

Submitted To: Jennifer Vandermeer, P.Eng.

Submitted By: Sylvia Radovic, B.E.S.

Reviewed By: Deanna De Forest, B.Sc. EP

1.0 Background

R.J. Burnside and Associates Limited (Burnside) has been retained by the Regional Municipality of York (Region) to undertake Class Environmental Assessment (EA) Studies for the proposed improvements to Warden Avenue from Major Mackenzie Drive to Elgin Mills Road and Kennedy Road from Major Mackenzie Drive to Elgin Mills Road. The purpose of this Technical Memorandum is to provide a review of the existing natural features in the Study Areas, identify potential impacts to these features and recommend mitigation measures. The Study Areas are located within the City of Markham Future Urban Area (FUA) with development blocks proposed west and east of both Warden Avenue and Kennedy Road. Lands adjacent to the Study Areas primarily consist of undeveloped agricultural lands and new development with some commercial, recreational, and residential properties. A Provincially Significant Wetland (PSW) known as Bruce & Berczy Creek Wetland Complex is located adjacent to the Study Area. A map of the Study Area locations is attached (Figures 1 and 2).

In 2021, natural heritage features within the Study Areas were summarized through an information review completed by Beacon Environmental; however, many of the observations were based on reports from previous studies completed within the vicinity of the Study Areas prior to August 2021 including Berczy Glen MESP, 2013/14 with additional investigation completed in 2016/17, and Angus Glen MESP, 2015/16 with additional investigations completed in 2017. Burnside completed a Site Reconnaissance of the Study Areas in 2022 to confirm

existing natural features and to assess the potential for aquatic and terrestrial Species At Risk (SAR) habitat within the Study Areas.

2.0 Methodology

Burnside staff conducted a Site Reconnaissance of the Study Areas on April 29, 2022. Observations of existing natural features within the proposed 41 m right-of-way (ROW), specifically 20.5 m east and west from the existing road centreline, were made from publicly accessible locations within the Study Area corridors, see Figures 1 and 2. Bridge and culvert structures were observed for the potential presence of nesting SAR birds. Vegetation inventory and species-specific surveys were not included as part of the scope of work for the Site Reconnaissance.

3.0 Natural Features

Ecological Land Classification (ELC)

In total, six communities consisting of undefined and defined ELC vegetation community descriptions from the 2021 Beacon Report, were updated following the 2022 Site Reconnaissance. Updates to ELC vegetation communities are outlined in Table 1. Updates to areas of potential SAR habitat are outlined in Table 1 and illustrated in Figures 1 and 2.

Table 1: Updates to ELC Communities and Potential SAR Habitat

Location	Community Observations		SAR Potential Habitat	
	2021 Beacon Reports	2022 Site Reconnaissance	Within Study Areas	Adjacent to Study Areas
Figure 1 – Warden Avenue				
W-1	Agriculture (Corn)	Agriculture (Winter Wheat)	No SAR potential	Winter wheat not considered suitable habitat for grassland avian SAR.
W-2	Undefined ELC with Breeding Bird Survey Area	Agriculture (Winter Wheat)	No SAR potential	Winter wheat not considered suitable habitat for grassland avian SAR.
W-3	Agriculture (Pasture)	Constructed (Earthworks in Progress)	No SAR potential	No SAR potential.
W-4	Agriculture (Row Crop / Pasture Anthropogenic)	Open Pasture	No SAR potential	Size of available habitat not considered suitable habitat for area sensitive avian SAR.

Location	Community Observations		SAR Potential Habitat	
	2021 Beacon Reports	2022 Site Reconnaissance	Within Study Areas	Adjacent to Study Areas
Figure 2 – Kennedy Road				
K-1	Agriculture with Breeding Bird Survey Area	Constructed (Earthworks in Progress)	No SAR potential	No SAR potential.
K-2	Agriculture with Breeding Bird Survey Area	Open Pasture	No SAR potential	Size of available habitat not considered suitable habitat for area sensitive avian SAR.

Aquatic

In Beacon's 2021 Report, Berczy Creek and Bruce Creek are considered direct fish habitat as defined under the Fisheries Act. Redside dace (Endangered) and Regulated habitat has been identified by MECP in Bruce Creek and Berczy Creek within the Study Areas.

Fish habitat within the Study Area was identified during the 2022 Site Reconnaissance based on observations of aquatic features (see Figures 1 and 2):

- Warden Avenue culvert crossing conveys the flow of Berczy Creek, south of Major Mackenzie Drive (Berczy Creek, a main tributary of the Rouge River): there is an old structure upstream of the culvert and downstream is a large concrete weir. Limited substrate was observed through the structure. There is a very large and deep pool at the outlet of the culvert. It is considered to be fish habitat and Redside dace habitat.
- Warden Avenue culvert crossing conveys the flow of Bruce Creek, north of Major Mackenzie Drive (a tributary of Berczy Creek). The watercourse functions as a roadside drain upstream, west of the road and then flows in a linear and densely vegetated channel from west to east downstream of the road. This watercourse is marginal fish habitat, and aquatic sampling would be required to confirm presence / absence of fish. It is considered contributing to Redside dace habitat.
- Kennedy Road bridge, north of Elgin Mills Road East conveys the flow of Bruce Creek which is a main tributary of the Rouge River. Bruce Creek, where it flows through the Kennedy Road bridge, is a permanently flowing watercourse that is considered fish habitat and Redside dace habitat.

4.0 Species at Risk (SAR)

SAR identified in the Study Areas in the Beacon Reports (2021) include: Barn swallow (*Hirundo rustica*), Bobolink (*Dolichonyx oryzivorus*), Eastern meadowlark (*Sturnella magna*), Bat SAR, Butternut (*Juglans cinera*) and Redside dace (*Clinostomus elongatus*).

Observations of potential SAR habitat for the identified species were made during the 2022 Site Reconnaissance.

Barn Swallow

Areas of potential habitat within the Study Areas include the bridge at the northern limits of Kennedy Road, north of Elgin Mills Road. No Barn swallow nests were observed within the Study Areas during the 2022 Site Reconnaissance.

In January of 2023, Barn swallow was re-classified from Threatened to Special Concern through amendments to Ontario Regulation 230/08. Barn swallow and its habitat is no longer protected under the ESA.

Bobolink / Eastern Meadowlark

Bobolink / Eastern meadowlark receive habitat protection under the ESA. Development exemptions for impact to the habitat of this species are addressed under the ESA in Ontario Regulation 830/21, Section 13. Generally, Section 13 applies to development activities that are related to the construction of buildings, structures, roads, or other infrastructure and the excavation and landscaping of land, in an area that is the habitat of Bobolink / Eastern meadowlark. If the size of the area of habitat of Bobolinks or Eastern meadowlarks that is damaged or destroyed by the activity is equal to or less than 30 ha and the person satisfies all of the conditions set out in Section 14, (i.e., Notice of Activity, Management Plan, and Habitat Creation), the exemption is applicable.

Habitat suitable for Bobolink / Eastern meadowlark was not observed within or immediately adjacent to the Study Areas. Potentially suitable nesting habitat previously identified by Beacon (2021) has since been fragmented or removed by earthworks and development. Consequently, no potential habitat remains in the Study Areas or immediately adjacent to the Study Areas.

Candidate Bat Maternity and Bat Roost Habitat

Since 2013, four bat species have been listed as Endangered under the ESA due to rapid declining population sizes caused by white-nose syndrome (WNS). Under the ESA, SAR bats and their general habitat are protected.

Among the four listed species, three are known to roost in forested habitats: Little brown myotis (*Myotis lucifugus*), Northern myotis (*Myotis septentrionalis*), and Tri-colored bat (*Pipistrellus subflavus*). While Little brown bat typically choose maternity roosts in anthropogenic structures, according to MNRF and Environment Canada (2015), key features of significant bat maternity roost habitat sites for Northern myotis and Tri-colored bat species, and to a lesser extent Little brown myotis, include:

- Deciduous Forest (FOD), Mixedwood Forest (FOM), Coniferous Forest (FOC), Deciduous Swamp (SWD), Mixedwood Swamp (SWM) and Coniferous Swamp (SWC) communities.
- Older forest stands that typically feature increased snag availability for roosting and foraging

under a relatively closed canopy and mature large-diameter trees with >25 cm diameter at breast height (DBH).
- Cavities with small entrances / crevices or loose bark.
- Cavities in tall tree snags of live trees that exhibit early to mid-stages of decay.

During the 2022 Site Reconnaissance, potentially suitable bat roost habitat trees were identified within or adjacent to the Warden Avenue and Kennedy Road Study Areas. See Figures 1 and 2.

Butternut

Under the ESA, if proposed development or site alteration may affect a Butternut tree or its habitat, the tree must be assessed through a Butternut Health Assessment to determine its health and confirm its status under the ESA. Under the assessment process, there are three categories of Butternut trees based on Butternut canker: Category 1 (affected to an advanced degree), Category 2 (not affected or not as advanced as Category 1) and Category 3 (may be useful in determining resistance).

Ontario Regulation 830/21 under the ESA, 2007, per clause 22 (b), states that if a Category 2 or Category 3 Butternut tree is to be retained in an area where impactful actions are part of, or incidental to, a larger activity such as construction, landscaping, development, or similar type of project, then under clause 31 (1) paragraph (2), the root harm prevention zone (i.e., protection zone) shall be the area surrounding the stem of the tree determined by the diameter of the tree stem, as illustrated below:

TABLE
ROOT HARM PREVENTION ZONE

Column 1 Item	Column 2 Tree stem diameter	Column 3 Root harm prevention zone (measured in metres from stem)
1.	Less than 3 centimetres	6
2.	At least 3 centimetres but less than 15 centimetres	9
3.	At least 15 centimetres but less than 30 centimetres	12
4.	At least 30 centimetres but less than 50 centimetres	18
5.	At least 50 centimetres	25

Source: O. Reg. 830/21: EXEMPTIONS - BARN SWALLOW, BOBOLINK, EASTERN MEADOWLARK AND BUTTERNUT under Endangered Species Act, 2007, S.O. 2007, c. 6.

During the 2022 Site Reconnaissance, two Butternut trees were identified at the northern limits of the Kennedy Road Study Area, north of Elgin Mills Road, located immediately adjacent to the Study Area ROW, approximately 27 m and 29 m from the existing road centreline of Kennedy Road, on the south side of Bruce Creek. See Figure 1.

Redside Dace

Under the ESA, Redside dace and its general habitat is protected. Redside dace habitat includes the watercourse, as well as the meander belt plus 30 m. Under Section 23.1, Ontario Regulation 242/08 of the ESA (2007), Redside dace is protected from being killed, harmed, harassed, captured, or taken and its habitat is protected from being damaged or destroyed.

Potential habitat for Redside dace was observed within the Study Areas during the 2022 site visit. Redside dace habitat is present within Berczy Creek crossing on Warden Avenue, south of Major Mackenzie and within the Bruce Creek crossing on Kennedy Road, north of Elgin Mills. Additional Redside dace contributing habitat is present within the Warden Avenue crossing of the tributary of Bruce Creek, located approximately 840 m north of the intersection of Major Mackenzie Drive. See Figures 1 and 2.

5.0 Potential Impact

5.1 Natural Features

Based on the Site Reconnaissance completed, project activities associated with the road widening within the proposed ROW are anticipated to include grading and vegetation removal.

- Some degree of disturbance or destruction of vegetation species will occur in the footprint required to widen the ROW.
- Earthworks and replacement of culvert crossings may result in sedimentation of watercourses.

5.2 Species At Risk (SAR) Habitat

- SAR bats may be impacted if potential bat roost habitat identified in the ROWs is removed during road improvements.
- SAR Butternut and its root protection zone may be impacted by grading and vegetation removal north of Elgin Mills Road.
- Impacts to SAR Eastern meadowlark and Bobolink are not anticipated as suitable habitat was not observed during Site Reconnaissance.
- Potential for disturbance or destruction of nesting SAR migratory breeding birds and their habitat may be impacted by grading and vegetation removal.
- Earthworks and replacement or rehabilitation of the bridge or culvert crossings on Bruce Creek Tributary and Berczy Creek may result in impacts to fish habitat and Redside dace habitat.

6.0 Recommended Mitigation Measures

6.1 Natural Features

- Minimize disturbance to existing vegetation. Adjust grading prior to construction to reduce impacts to trees by increasing the steepness of slopes in isolated locations, where feasible. Impacts to vegetation communities within the PSW wetland adjacent to the Study Areas should be avoided.
- An Erosion and Sediment Control (ESC) plan should be developed during Detailed Design

prior to construction. Silt fence shall be used to delineate the limit of the construction area adjacent to wetland communities (i.e., through the designated PSW area). No storage, stockpiling, or staging shall occur beyond the work area delineated by silt fencing.

- All materials and equipment used for the purpose of site preparation and project completion should be operated, maintained, and stored in a manner that prevents any deleterious substance (e.g., petroleum products, silt, etc.) from entering the wetland or watercourses.
- Soils shall be immediately stabilized following disturbance using a seed mix suitable to the site conditions, selected in consultation with the local Conservation Authority.

6.2 Wildlife and Species at Risk (SAR)

- To reduce the risk of contravening the federal Migratory Bird Convention Act, 1994 (MBCA) and potential impact to wildlife, including SAR birds, bats, and reptiles, vegetation clearing should not be completed between April 1 to October 31 to avoid the active period for the following:
  - Breeding birds – broadly from April 1 to August 31 for most species, regardless of the calendar year. Active nests (nests with eggs or young birds) of protected migratory birds, including SAR protected under the ESA, cannot be destroyed at any time of the year; and
  - Bat species – Endangered – considered to be between April 1 to October 31, of any calendar year.
- A Butternut Health Assessment should be completed to determine Category of Butternut if proposed earthworks and disturbance is located within 25 m of the identified Butternut adjacent to the Study Area on Kennedy Road. If Category 2 or 3 is determined, the appropriate Butternut root harm prevention zone is to be applied.
- Removal of candidate bat roost habitat trees within the Study Areas should be avoided. If avoidance of individual candidate roost habitat trees is not possible, consultation with MECP (corr. Jeff Andersen, June 14, 2022) has indicated that “Acoustic sampling should be employed to determine presence or absence of SAR bats. If present, acoustic sampling will help to determine species, relative abundance, and type of permissions required.”
- Should improvements to the Kennedy Road bridge structure be required, the presence of nests should be assessed through observations of the structure during the breeding bird season immediately prior to structure improvements or alterations to confirm no nests have been established and the structure is not being used by breeding birds.
- Permitting will be required under the Fisheries Act for any in-water works. This is completed through the submission of a request for review form, project drawings, site photos, and a report of aquatic habitat conditions to the Department of Fisheries and Oceans (DFO).
- Permitting under the ESA if works are required for the Kennedy Road Bridge, or to the Berczy Creek culvert south of Major Mackenzie Drive. Redside dace habitat includes the watercourse, as well as the meander belt plus 30 m, so any alterations within this area (vegetation removals, grading, in-water works, etc.) will require permitting or project registration. If a project can meet certain criteria (including the work area being under 300 m^2, not increasing the footprint by more than 25%, working in the timing window of

July 1 to September 15), then project registration with MECP is possible. Project registration negates the need for permitting under the ESA. If the project cannot adhere to registration criteria, then an Information Gathering Form (IGF) would be submitted to MECP to begin the ESA permitting process for Redside dace. Depending on the potential impacts to Redside dace habitat, an overall benefit permit from MECP may be required.

R.J. Burnside & Associates Limited

Sylvia Radovic, B.E.S.
Ecologist
SR:tm

Enclosure(s) Figure 1 – Warden Avenue and K
Figure 2 – Warden Avenue and K

Sources:

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This map is the product of a Geographic Information System (GIS). As such, the data represented on this map may be subject to updates and future reproductions may not be identical.

Study Area
Updated ELC
Wetland (Unevaluated)
Potential Bat Habitat Tree (Individual)
Wetland (Provincially Significant)
Potential Bat Habitat Trees (Multiple Trees)
Watercourse

ELC Code	ELC Description
AG	Agriculture
CV	Constructed
OAGM4	Open Pasture

Datum: North American 1983 CSRS	
Coord. System: NAD 1983 CSRS UTM Zone 17N	
Projection: Transverse Mercator	
Central Meridian: 81°0'0.00"W	
False Easting: 500,000m	False Northing: 0m
Page Orientation: 0°	Scale Factor: 0.99960

N
Grid North

0 100 200 300 400 500 600
Metres

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Client
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Map Title
WARDEN AVE AND KENNEDY RD EA STUDIES
WARDEN AVE

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Study Area
Wetland (Unevaluated)
Wetland (Provincially Significant)
Watercourse
Updated ELC
Potential Bat Habitat Tree (Individual)
Potential Bat Habitat Trees (Multiple Trees)
Butternut Tree

ELC Code	ELC Description
CV	Constructed
OAGM4	Open Pasture

Datum: North American 1983 CSRS	
Coord. System: NAD 1983 CSRS UTM Zone 17N	
Projection: Transverse Mercator	
Central Meridian: 81°0'0.00"W	
False Easting: 500,000m	False Northing: 0m
Page Orientation: 0°	Scale Factor: 0.99960

N
Grid North

0 100 200 300 400 500 600
Metres

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Client
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Map Title
WARDEN AVE AND KENNEDY RD EA STUDIES
KENNEDY RD

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