BURNSIDE

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# Appendix G

# Natural Environment Report and Existing Natural Features Technical Memo

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BEACON ENVIRONMENTAL

GUIDING SOLUTIONS IN THE NATURAL ENVIRONMENT

# Natural Environment Report

## Warden Avenue 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 improvements along Warden Avenue from 300 m north of Elgin Mills Road to 300 m south of Major Mackenzie Drive East in the City of Markham ("the City"). This length of Warden Avenue 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 Berczy Glen Block 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.

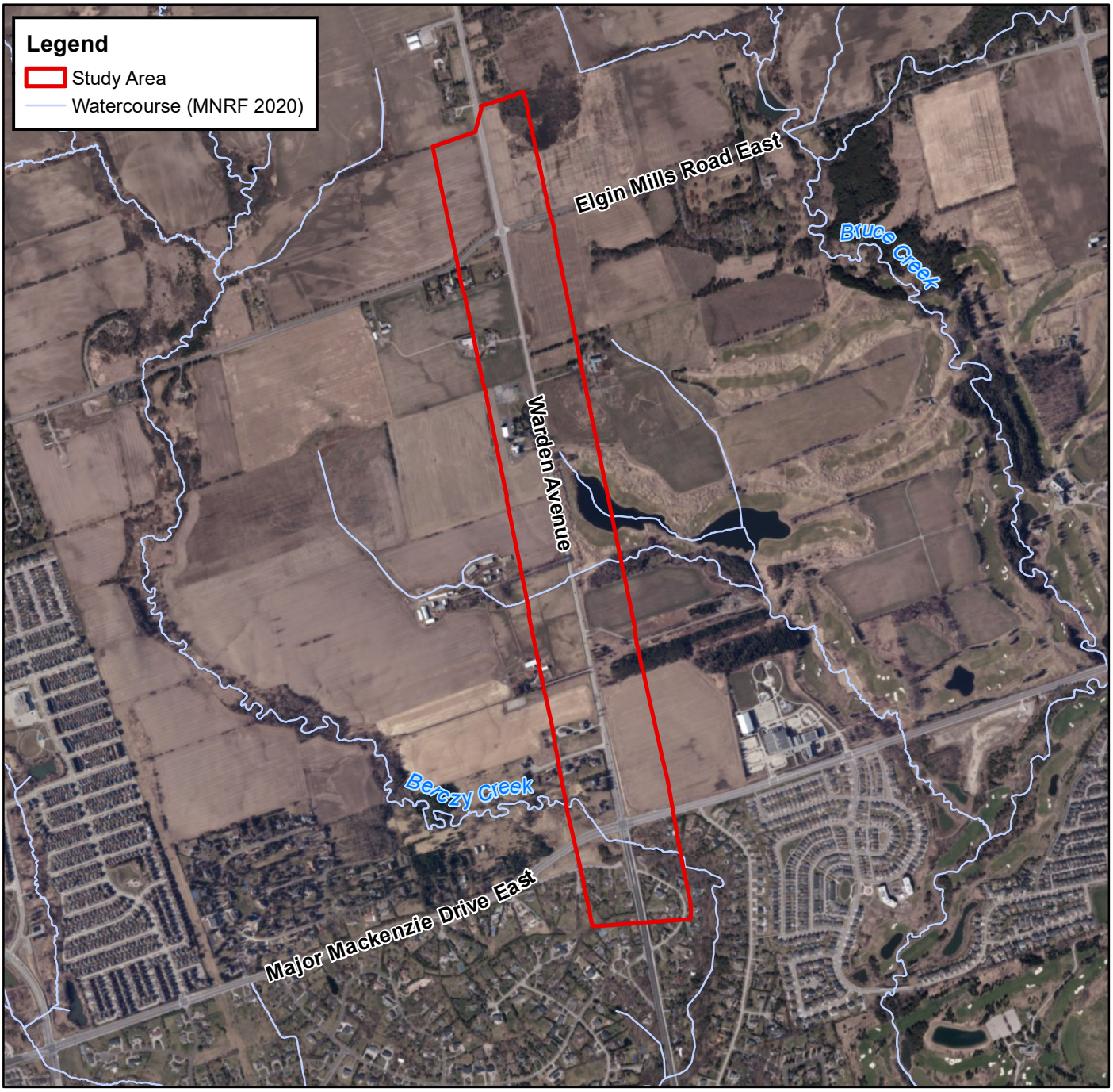
Environment Canada currently considers the “high risk” period for encountering nesting birds in southern Ontario to be from mid-March to late August. Regardless of the date, any nest and the habitat to support the nesting birds is protected under the MBCA, and therefore even for proposed vegetation clearing 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.

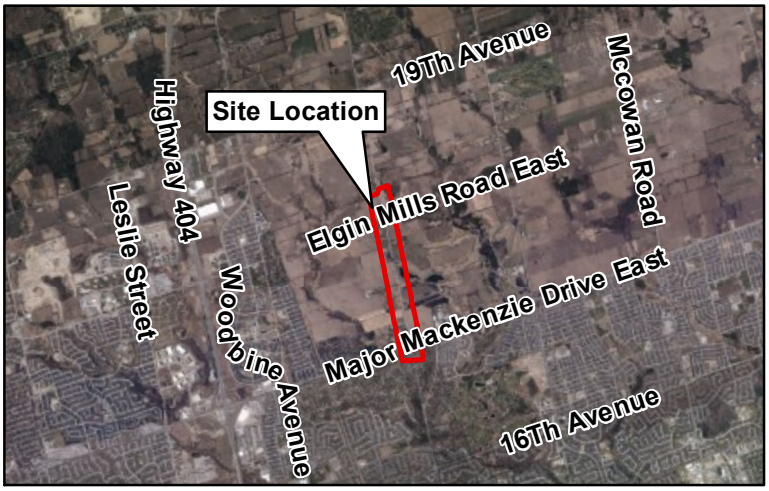
## 2.2 Provincial

### *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 |
|---|---|
| Warden Avenue Natural Environment Report | |
| BEACON ENVIRONMENTAL | Project: 220329<br>Last Revised: June 2021 |
| Client: Regional Municipality of York | Prepared by: DU<br>Checked by: SG |
| 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 the Berczy Creek valley crossings 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.*

All woodlands within the Berczy Creek valley and the Bruce Creek Tributary corridor meet the test of "significance" by virtue of their proximity to Redside Dace habitat and because portions are considered part of the PSW.

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 considerations 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, in regard to 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).

### *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 corridors of the Bruce Creek Tributary and Berczy 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 Area which includes Bruce Creek tributary, 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 Berczy Glen Block and Angus 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 Berczy Glen Block and Angus Glen Block. This was undertaken following completion of a gap analysis to determine if any gaps existed in the data to adequately characterize the Berczy Glen Block and Angus 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 Berczy Glen Block and Angus Glen Block.

### 3.1.1 Background Review

Background information regarding the physical and natural setting of the Berczy Glen Block and Angus 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 MESP), prepared by SKA, *et al*. (2017).

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 any data gaps identified upon review of the above listed documents.

### 3.1.2 Field Investigations

Most field investigations for the Berczy Glen MESP were completed in 2013/2014 with more recent investigation being completed in 2016/2017 to fill in any data gaps. Field investigation completed for the Angus Glen MESP were primarily completed in 2015 to 2016, with some additional investigations completed in 2017 as well. In 2021 field reconnaissance was completed for the lands within the Subject Lands that were outside of the Berczy and Angus Glen's scope, primarily 300 m north of the Warden Avenue and Elgin Mills Road East intersection and 300 m south of the Warden Avenue and Major Mackenzie Drive East intersection, including the Berczy Creek valley crossings of Major Mackenzie Drive East and Warden Avenue.

West Side of Warden Avenue (Berczy Glen Block):

- Terrestrial resources were investigated on the subject lands on July 31, 2013, August 29, 2013 and June 21, 2017;
- Breeding birds were surveyed on June 4th and June 20th, 2013 within the Berczy Glen Block. Third visits were conducted on July 6, 2013 and June 26, 2014 respectively;
- Breeding amphibian surveys were undertaken during the evenings after dusk on April 17, 2013, April 28, 2014, May 20, 2014 and July 2, 2014;
- Surveys for potential SAR bat habitat were completed on May 3 and May 4, 2017;
- Aquatic habitat assessments on the main branch of Berczy Creek, upstream of Subject Lands (within the Berczy Glen Block), were completed on August 20, 2013;

- HDFA investigations were undertaken on the Berczy Glen lands on April 11, 17, 23, 24, May 28, 30, August 29 and September 19, 2014. BR2-H15 was fished on July 22, 2015 and May 5, 2016; and
- Surveys for potential SAR bat habitat were completed on May 3 and May 4, 2017 according to the guidelines provided by MNRF.

East Side of Warden Avenue (Angus Glen Block):

- Breeding birds were surveyed on May 26, May 30 and June 19, 2013 on the majority of the Angus Glen Block. Third visits were conducted on June 19, 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 on the Angus Glen Block on April 17, 23, May 13, 28, 30, August 29. An additional site visit was completed on July 22, 2015;
- Aquatic habitat assessments on the Tributary of Bruce Creek, were completed on August 13 and 20, 2013; and
- Breeding amphibian surveys were undertaken during the evenings after dusk on April 17, 20-13, May 7, 2013 and June 18, 2013. To complete a full season of amphibian surveys, three rounds of call count surveys were conducted in 2017, on April 11, May 15 and June 27.

#### *3.1.2.1 Aquatic Habitat Assessment*

Fish habitat assessments were completed, on the Bruce Creek Tributary and on the main branch of Bruce Creek upstream of the Subject Lands, to identify and assess watercourse characteristics that 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 water body. 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 consist 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) was referenced to identify the fish community within the Bruce and Berczy Creek Subwatershed. Fish community sampling was not completed in Berczy and Bruce Creek because of the presence of an Endangered fish species, Redside Dace (*Clinostomus elongatus*) and due to the abundance of background information. However, sampling of the headwater portion of the Bruce Creek Tributary (BR2-H15) in the Bruce Creek Subwatershed was undertaken upon MNRF (who at the time administered the ESA) request.

#### *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 Berczy Glen Block and Angus Glen Block including 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 5ºC of normal, and no precipitation.

The Berczy Glen Block and Angus Glen Block were walked such that all singing birds could be heard or observed and recorded. That is, the surveyor is within 50 m to 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 Subject Lands and a detailed habitat inventory will be completed in future design phases of the project at 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 is within both the Bruce and Berczy Creek subwatersheds within the larger Rouge River watershed boundary and under the jurisdiction of the TRCA. The main branch of Berczy Creek traverses the southern portion on the Subject Lands and crosses under the Warden Avenue and Major Mackenzie Drive East intersection. Berczy Creek originates approximately 12 km northwest of the Subject Lands along the southern slope of the Oak Ridges Moraine. A tributary to Bruce Creek originates west of Warden Avenue and flows in a south easterly direction under Warden Avenue, towards Major Mackenzie Drive East where it discharges into the main branch of Bruce Creek, approximately 2 km downstream.

**Berczy Creek (BE1A):**

In support of the MESP, assessment of Reach BE1A was limited to those portions of the reach located within public ownership (ROW). Referencing those observations, Reach BE1A was characterized as a well-defined channel, flowing through a confined valley setting, with a moderate gradient and degree of sinuosity. Riparian vegetation consisted of trees, shrubs and grasses, which formed a continuous cover, extending more than five channel widths laterally. Riffle substrate consisted of gravel, cobbles, and boulders, while pool substrate consisted of clay, silt, and sand. Bank material consisted of clay, silt, sand, gravel, and small cobbles, and bank angles were found to range between 60-90°. Bankfull widths and depths ranged between 5.3-7.2m, and 0.55-1.2m, respectively.

**Berczy Creek (BE1B):**

In support of the MESP, assessment of Reach BE1B was limited to those portions of the reach visible from the Berczy Glen Block, and the Major Mackenzie Drive East ROW, this reach was characterized as a well-defined channel, flowing through a confined valley setting. The channel was characterized by having a moderate gradient and degree of sinuosity. Riparian vegetation consisted of trees, shrubs, grasses and herbaceous species, which formed a continuous cover, extending 1-5 channel widths laterally. Bank angles ranged between 60-90°, and bank materials were composed of clay and silt. Bankfull widths ranged between 2.8-3.6m, and bankfull depths ranged between 0.65-0.8m. Substrate in riffles consisted of clay, silt, small cobbles and boulders, while pool substrate consisted of clay and silt.

**Tributary of Bruce Creek crossing of Warden Avenue (BR2-H15):**

The headwater section (H15) of Bruce Creek Tributary, on the west side of Warden Avenue, is described as a tile drain/granular ditch system that collects surface runoff and shallow groundwater from the Berczy Glen Block and is piped under Warden Avenue to a discharge outlet to Bruce Creek Tributary (BR2) approximately 90 m east of Warden Avenue. This feature is piped through the Berczy Glen Block, except for a small open water section approximately 135m long beginning approximately 420m west of Warden Avenue. The upstream portion of the feature has been channelized and tile drained to facilitate drainage of the adjacent agricultural lands. This feature has been heavily modified through agricultural practices and consists of both tiled and open channel features.

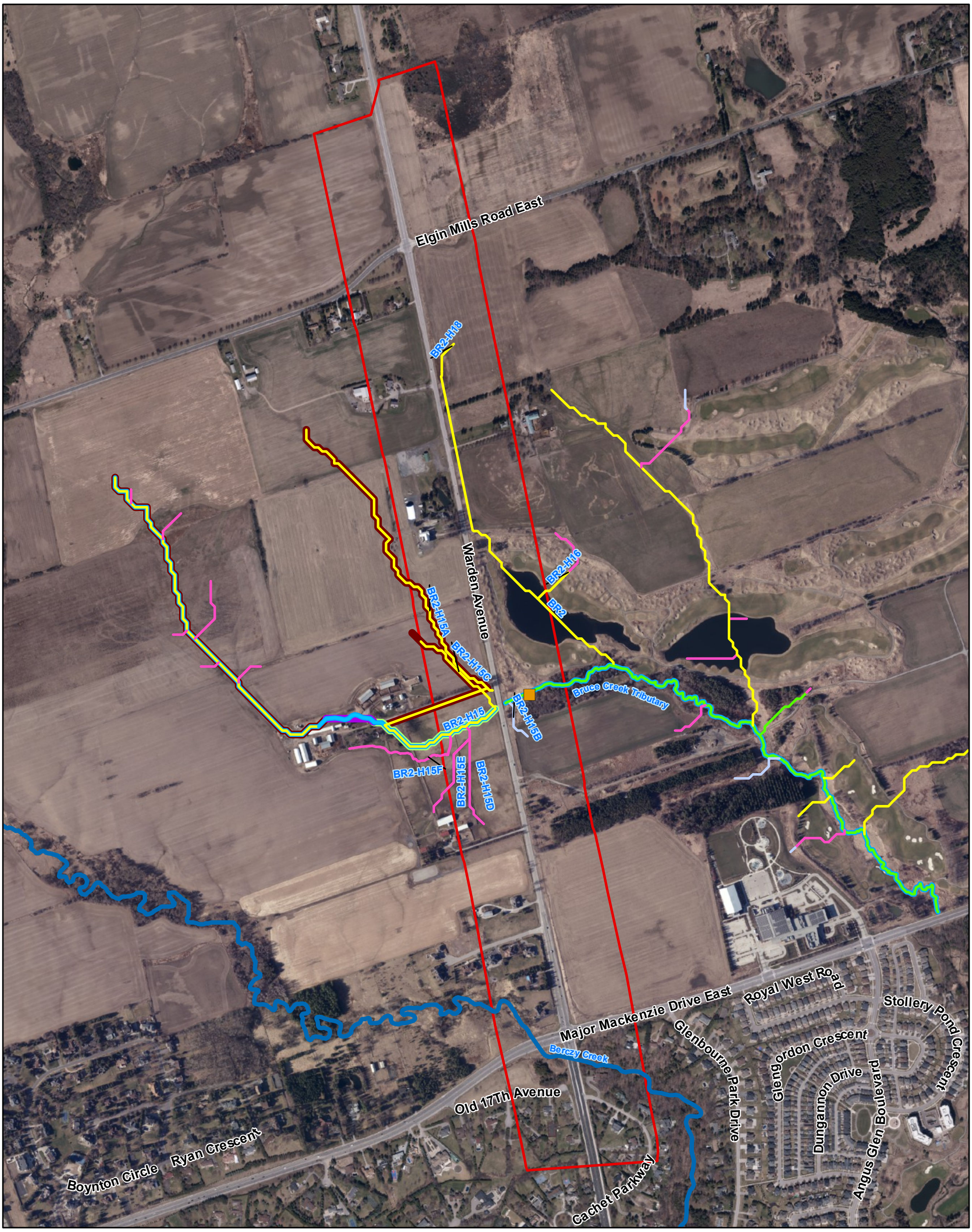
The uppermost reach of the Bruce Creek Tributary on the Angus Block, east side of Warden Avenue, is described as a more defined feature with low, stable banks and a more established riparian corridor that was lined with grasses and meadow species that overhang the channel. Canopy cover was sparse and provided by mature trees. Substrates consisted of cobble, gravel and sand. The channel was approximately 1.5 m wide and the average water depth is approximately 0.25 m. The water was stagnant at the time of the investigation. Some small woody debris was present including a fallen tree downstream of the site. Detritus and algae were growing on the rocks. A tile drain from the Schickedanz lands west of Warden Avenue outlets near the assessment location.

As this feature conveys baseflow to downstream reaches of the tributary that flow directly into Bruce Creek, it and its PSW has been designated contributing Redside Dace habitat and has been approved for natural channel design (refer to **Figure 2**).

#### *3.2.1.1 BR2-H15 Enhanced Corridor*

In accordance with Minutes of Settlement executed through the SWS for BR2-H15, the proposed 135 m long BR2-H15 enhanced corridor will have a top width of 30 m and a floodplain dimension of 12 m. The floodplain width is sufficient to accommodate a 10 m meander belt, as delineated for BR2-H15 through the MESP.

The detailed design process for the BR2-H15 enhanced corridor considered the future widening of Warden Avenue. Detail designs for the enhanced corridor are currently under review by relevant regulatory agencies.




## Legend

- Subject Lands
- Open Section
- Tile Overflow
- Piped
- Approximate Location of Tile Outlet

### Headwater Drainage Feature Assessment

- Unclassified
- Conservation
- Mitigation
- No Management Required
- Protection

### Thermal Regime

- Cold
- Cool

# Aquatic Existing Conditions

**Figure 2**

Warden Avenue Natural Environment 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 Headwater Drainage Features

Within the Subject Lands a total of nine features in the Bruce Creek Tributary subcatchment. These features are largely agricultural tile drainage systems or undefined overland flow routes through actively farmed areas.

**Table 1. Headwater Drainage Feature Summary**

| ID | Feature Description | Flow Regime | HDF Assessment |
|---|---|---|---|
| BR2 | Golf course pond segment | - | Mitigation |
| BR2-H18 | Tile drain and roadside ditch draining into golf course pond | Ephemeral | Mitigation |
| BR2-H16 | Drainage feature to golf course pond. | Intermittent | Mitigation |
| BR2-H15 | Mainly buried feature that tile-drains large area of field and outlets into a short open section that drains under Warden Avenue into Bruce Creek Tributary.<br><br>Perennial flow occurs along open reach. | Permanent | Mitigation (tiled section)<br><br>Protection (open section)<br><br>*Note: this feature is subject to approved natural channel design* |
| BR2-H15A | Tile drainage from agricultural field | Intermittent | Mitigation |
| BR2-H15B | Small drainage feature from adjacent agriculture field | Unclassified | Unclassified |
| BR2-H15C | Tile drainage from agricultural field | Intermittent | Mitigation |
| BR2-H15D | No Management | | |
| BR2-H15E | | | |
| BR2-H15F | | | |

#### 3.2.1.3 Fish Community

Existing fisheries information for Bruce and Berczy Creek was obtained from the Rouge River Watershed Fisheries Management Plan (TRCA and MNR draft 2011). The Berczy Creek subwatershed is in Fisheries Management Zone 2 (FMZ 2). The Bruce Creek sub-watershed is located in Fisheries Management Zone 3 (FMZ 3). Fish community sampling was undertaken in Bruce Creek in coordination with the SWS team and MNRF. In addition, Beacon completed fish community sampling in the Bruce Creek Tributary.

**Berczy Creek Subwatershed**

Berczy Creek provides spawning and nursery habitat for migratory Rainbow Trout (*Oncorhynchus mykiss*), which is an introduced species to the system. Historically, Brown trout stocking also occurred in the Rouge River watershed but no longer does. The 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 Drive East. The northern portion (upstream of the Warden Avenue and Major Mackenzie Drive East) is still largely rural and supports healthy populations of Redside Dace. Berczy Creek provides habitat for twenty-two fish species within or close to the north Markham FUA (AMEC 2015). An additional thirteen have been captured elsewhere in the

Berczy Creek subwatershed, but typically inhabit larger waterbodies or ponds. As detailed in the Fisheries Management Plan, the target species for Berczy Creek include:

- Redside Dace;
- American Brook Lamprey (*Lampetra lamottei*);
- Rainbow Darter (*Etheostoma caeruleum*);
- Brassy Minnow (*Hybognathus hakinsoni*); and
- Rainbow Trout.

Redside Dace require cool, clear flowing water with riffle-pool morphology and overhanging streamside vegetation. Stream sections flowing through open terrestrial habitats with overhanging vegetation, undercut banks and submerged branches and logs are most suitable. Channel depths are typically less than 1 m and substrate can vary from fine sediment to cobbles and boulders; however, they are most often present in gravel/cobble bed habitat and often with a shallow surface covering of silt or detritus (RDRT 2010). Redside Dace are a coolwater species and are usually associated with water temperatures of less than 24°C.

Redside Dace is provincially listed as Endangered and is provided species and habitat protection under the ESA (2007). Federally the species is listed as Endangered under Schedule 1 of the SARA. Redside Dace habitat within the Subject Lands is discussed in **Section 4.2**.

American Brook Lamprey is listed as Special Concern under the ESA. Adults 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). Berczy Creek, within the Subject Lands, provides suitable habitat for the American Brook Lamprey. 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. Berczy Creek, within the Subject Lands, provides suitable habitat for the Rainbow Darter. The Brassy Minnow is a coolwater species that is tolerant of a wide range of water temperatures and conditions. They are typically found in pools of sluggish, clear creeks and small rivers with soft bottoms. This species is typically associated with aquatic vegetation. Berczy Creek, within the Subject Lands, does not provide suitable habitat for the Brassy Minnow. 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. As detailed in the Fisheries Management Plan, Rainbow Trout are stocked in several locations in Berczy Creek and likely move throughout the system. At this time, this location is currently not stocked but could be re-started by the Agencies at any time.

**Bruce Creek Subwatershed**

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 Drive East. 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*).

Most of the fish species located within Bruce Creek system are a mix of warmwater, coolwater and coldwater species. The occupied Redside Dace habitat within Bruce Creek receives groundwater

discharge from Bruce Creek Tributary that has its most upstream reaches within the Subject Lands. Bruce Creek Tributary is designated as contributing Redside Dace habitat.

Bruce Creek provides habitat for twenty-five fish species within or close to the north Markham FUA (AMEC, 2015). An additional ten have been captured elsewhere in the Bruce Creek subwatershed. As detailed in the Fisheries Management Plan, the target species for Bruce Creek include:

- Redside Dace;
- American Brook Lamprey;
- Rainbow Darter;
- Mottled Sculpin (*Cottus bairdii*);
- Brook Trout; and
- Rainbow Trout.

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). Bruce Creek Tributary within the Subject Lands may provide suitable habitat for the American Brook Lamprey and it was caught in the main branch of Bruce Creek were captured in 2014 within the Angus Glen Block. 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 Tributary within the Subject Lands currently does not 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 the Bruce Creek Tributary. 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), therefore there may be suitable habitat present in the Bruce Creek Tributary. 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 Block and likely move throughout the system insofar as barriers permit passage.

Ecologists from Beacon completed a fish community survey on July 22, 2015 to confirm presence/absence of any fish within the upstream (west side of Warden Avenue) portion of Bruce Creek Tributary. Approximately 55 m of the channel was electrofished on the Berczy Creek Block. No fish were captured or observed. On May 5, 2016, the Berczy Glen landowners' consultants, along with staff from MNRF, TRCA and the City, completed a fish community survey to confirm the results from the July 22, 2015 survey. Similarly, no fish were captured. According to MECPH, this feature conveys baseflow to downstream reaches and therefore the feature has been designated contributing Redside Dace habitat.

### 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.

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

This community cover a small amount of the Subject Lands, extending from the manicured golf course holes to the property boundaries in several areas. Dominant plant species include native and non-native grasses and forbs such as Great Fescue (*Lolium giganteum*), Kentucky Bluegrass (*Poa pratensis ssp. pratensis*), Timothy Grass (*Phleum pratense*), Orchard Grass (*Dactylis glomerata*), Smooth Brome (*Bromus inermis ssp. inermis*), White Sweet Clover (*Melilotus alba*) and Black Medic (*Medicago lupulina*).

**Duckweed Floating-leaved Shallow Aquatic (SAF1-3)**

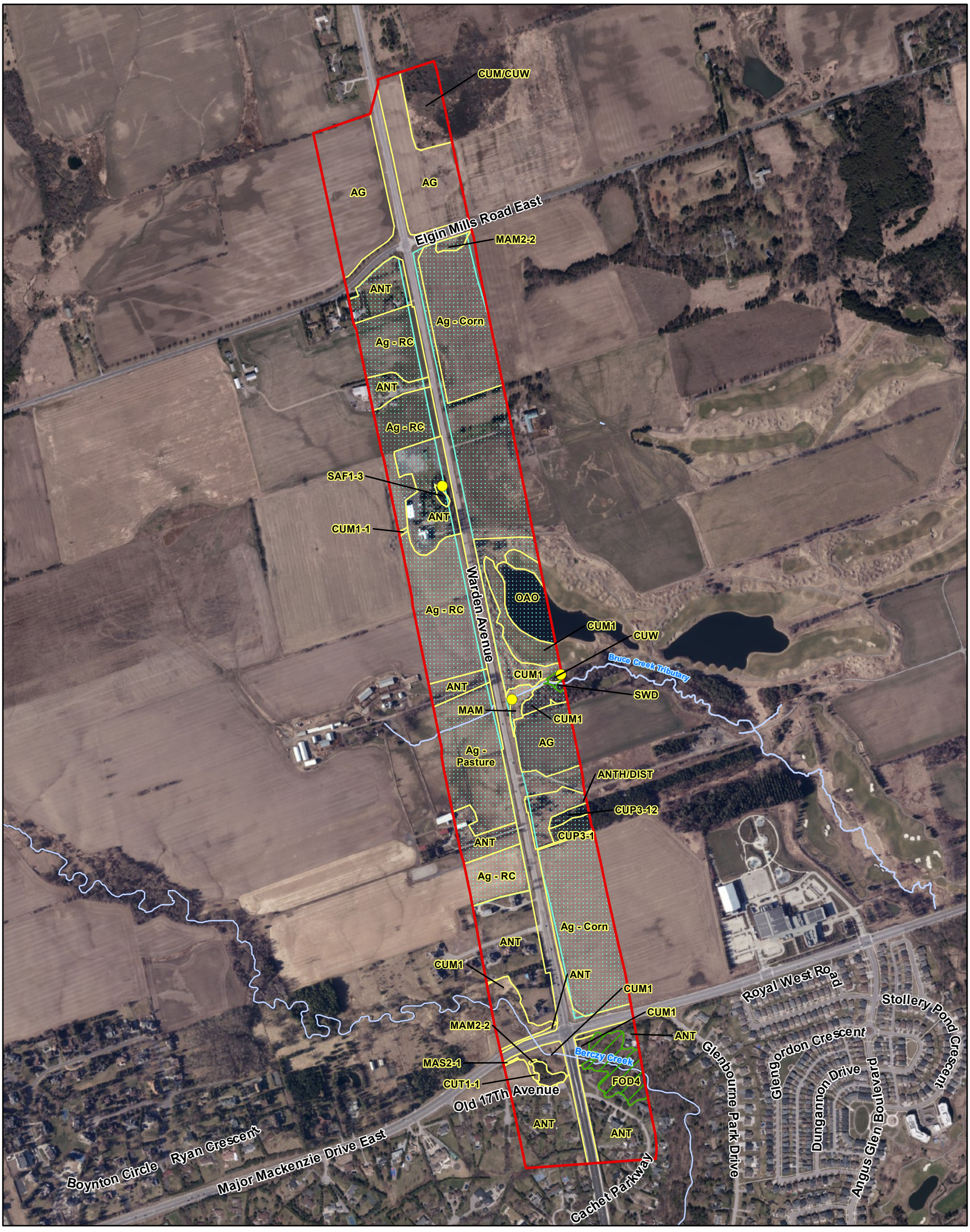
A pond is located on the Passafiume property on the west side of Warden Avenue. It is dominated by open water with floating aquatic vegetation including: Lesser Duckweed (*Lemna minor*) and Greater Duckweed (*Lemna major*). Barnyard Grass (*Echinochloa wiegandii*) and Narrow leaved Cattail (*Typha angustifolia*) are present along the edges of the pond.

**Reed-canary Grass Mineral Meadow Marsh (MAM2-2)**

There is one small patch of meadow marsh vegetation adjacent to the mowed lawn of the second residential property west of Warden Avenue along Elgin Mills Road. This community is dominated by Reed Canary Grass (*Phallaris arundinacea*, a ubiquitous wetland grass in Southern Ontario), with occasional patches of Narrow-leaved Cattail (*Typha angustifolia*). A meadow marsh community was also identified along Berczy Creek approximately midway through the block.

**Cattail Mineral Shallow Marsh (MAS2-1)**

This wetland community occurs in one small area on the Subject Lands, often associated with drainage ditches or small dug ponds. The dominant species is Broad-leaved Cattail (*Typha latifolia*), but there are smaller areas that are dominated by Reed Canary Grass (*Phalaris arundinacea*) or Common Reed (*Phragmites australis*). There are also scattered shrubs such as Red-osier Dogwood and Willows (*Salix* spp.). Other herbaceous species observed at the time of site investigations include Purple Loosestrife (*Lythrum salicaria*), Canada Goldenrod and Spotted Joe-pye Weed (*Eupatorium maculatum*).




## Legend

- Subject Lands
- ELC Communities
- Significant Woodland
- Watercourse
- Area of Breeding Bird Survey
- Amphibian Survey Location

| Code | Wetland Communities |
|---|---|
| OAO | Open Aquatic |
| MAM2-2 | Reed-canary Grass Mineral Meadow Marsh |
| MAS2-1 | Cattail Mineral Shallow Marsh |
| MAM | Meadow Marsh |
| SWD | Deciduous Swamp |
| SAF1-3 | Duckweed Floating-leaved Shallow Aquatic |
| | **Forest Communities** |
| FOD4 | Dry - Fresh Deciduous Forest |
| | **Cultural Communities** |
| CUP3-12 | Red Spruce Coniferous Plantation |
| CUP3-1 | Red Pine Coniferous Plantation |
| CUT1-1 | Sumac Cultural Thicket |
| CUM1-1 | Dry - Moist Old Field Meadow |
| CUM1 | Mineral Cultural Meadow |
| CUW | Cultural Woodland |
| | **Other Communities** |
| ANT | Anthropogenic |
| Ag-RC | Agricultural - Row Crop |
| Ag-Corn | Agricultural - Corn Crop |

# Terrestrial Existing Conditions

**Figure 3**

Warden Avenue Natural Environment Report

BEACON ENVIRONMENTAL

Project: 220329
Last Revised: June 2021

Client: Regional Municipality of York

Prepared by: BD
Checked by: CG

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**Open Aquatic (OAO)**

There are two large, deep (>2m) irrigation ponds within the golf course on the east side of Warden Avenue. A small portion of one irrigation 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.

**Dry - Fresh Deciduous Forest (FOD4)**

This forest community is associated with the Berczy Creek valley crossing of east of Warden Avenue and was assessed from aerial and roadside investigations.

**Coniferous Plantation (CUP3)**

Plantations CUP3-1 and CUP3-12 occur as long linear treed blocks; these are also the youngest plantations present. This is a young plantation of Red Pine (*Pinus resinosa*) and Red Spruce (*Picea rubens*) blocks are about 20 years old and consist of young trees, established to supply nursery stock for landscaping on the adjacent Angus Glen golf course.

**Cultural Woodland/Cultural Meadow (CUW/CUM)**

These woodland and meadow communities are located east of Warden Avenue north of Elgin Mills Road in the northeast corner of the Subject Lands. It was assessed from aerial and roadside investigations.

**Hawthorn Cultural Thicket (CUT1)**

This thicket community is associated with the Berczy Creek valley crossing of west of Warden Avenue. The hawthorn cultural thicket is located on the north side of the creek and is dominated by hawthorns (*Crataegus* spp.), with occasional Common Apple, and Common Buckthorn. Dominant ground flora includes Enchanter's Nightshade, Wild Mock-cucumber (*Echinocystis lobata*), and Thicket Creeper (*Parthenocissus vitacea*). Overall plant diversity is quite low, given the disturbed nature of the feature as well as the heavy shade below the hawthorns. Since the community occurs in the lowlands, soil moisture conditions are likely very fresh.

#### *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**).

#### 3.2.2.3 Amphibians

Surveys completed on the Berczy Glen Block did not identify any suitable habitat was identified and breeding amphibian surveys were not continued. There were no amphibian calls at any of the survey stations during the second round of amphibian surveys.

Surveys completed in the Angus Glen Block identified a total of four species. All species observed are widespread and common in Ontario. However, the Gray Treefrog (*Hyla versicolor*) and Bullfrog (*Rana catesbeiana*) 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. Green Frog (*Rana clamitans*) are mostly aquatic, rely on deeper permanent waters, and may be found in relatively poor-quality water. American Toads (*Bufo americanus*) are habitat generalists, and they will use a variety of wetland or pond types for both breeding and summering. They require “burrowable” soil for hibernation.

#### 3.2.2.4 Breeding Birds

There were 47 species of birds were recorded on the Berczy Glen Block, 42 of which were breeding or suspected to be breeding. Most of the species recorded are common, rural, disturbance-tolerant birds of edge and thicket habitat. The most numerous breeding species were Red-winged Blackbird (*Agelaius phoeniceus*), Savannah Sparrow (*Passerculus sandwichensis*), Barn Swallow, Song Sparrow (*Melospiza melodia*), American Robin (*Turdus migratorius*) and European Starling (*Sturnus vulgaris*), with smaller numbers of other species. Presence of Killdeer (*Charadrius vociferous*), Horned Lark (*Eremophila alpestris*) and Vesper Sparrow (*Pooecetes gramineus*) is usually indicative of large, cultivated. Small numbers of forest specialist species were found along the wooded sections of the creek near the western boundary of the Berczy Glen Block. Forest specialists that were recorded, in areas associated with the Berczy Creek corridor, included Great-crested Flycatcher (*Myiarchus crinitus*), Red-breasted Nuthatch (*Sitta canadensis*), White-breasted Nuthatch (*Sitta carolinensis*) and Eastern Wood Pee-wee (*Contopus virens*). Several species of thicket habitats were also recorded including Brown Thrasher (*Toxostoma rufum*), Gray Catbird (*Dumatella carolinensis*), and Common Yellowthroat (*Geothlypis trichas*), again primarily in scrubby thicket habitat along the creek corridor.

There were 59 species of birds were recorded on the Angus Glen Block, 52 of which were breeding or suspected to be breeding. Most of the species recorded are common, rural, disturbance-tolerant birds of edge and thicket habitat. The most numerous breeding species, that were not observed on the Berczy Glen Block, include Bobolink and American Goldfinch (*Spinus tristis*). With the exception of the Bobolink, which is a species that is typically present in undisturbed grasslands and pastures, all of the species observed are birds commonly found in disturbed and edge habitats. Disturbance-sensitive species that made up the majority of the breeding birds included Cooper’s Hawk (*Accipiter cooperii*) and several forest species including Hairy Woodpecker (*Picoides villosus*), Pileated Woodpecker (*Dryocopus pileatus*), White-breasted Nuthatch, and American Redstart (*Setophaga ruticilla*).

No provincially “rare” bird species were recorded (ranked as S1-S3, Critically Imperiled through Vulnerable, by Natural Heritage Information Centre, MNRF), and none of the species recorded are considered to be regionally rare. Four of the species identified as SAR and are listed federally and provincially as Threatened. Barn Swallow, Bank Swallow, Bobolink, and Eastern Meadowlark. Bank Swallows were noted foraging over the property but were not breeding. The other three 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. Barn Swallows were regularly seen flying around the farms along Warden Avenue. Surveys of all the suitable nesting buildings on the Berczy Glen Block resulted in the identification of 16 active nests scattered among the numerous buildings on the farms along Warden Avenue.

Bobolink and Eastern Meadowlark are both grassland specialists. The Bobolink is a songbird that usually breeds in extensive agricultural grasslands, especially hayfields, and old fields with tall, lush forb vegetation. Historically in the east, the species benefited from human alteration of the landscape, however, in the last several decades the populations in Ontario and other jurisdictions are thought to have declined. The declines are thought to be due to a combination of: changes in agricultural practice (leading to direct mortality when fields are plowed in June), habitat loss (due to natural succession or urbanization), and pesticide exposure and bird control on their wintering grounds. Twenty-five (25) singing males were recorded on the Angus Glen Block, occurring in two main areas within, or in close proximity to, the Subject Lands: in the uncut fields near the southwest edge of the property and a neighbouring farm along Warden Avenue, which had extensive uncut pasture favored by Bobolinks (refer to **Figure 4** for suitable nesting habitat within the Subject Lands). On the Berczy Glen Block the uncut horse pastures between the two farms in the southeast corner along Warden Avenue was the only suitable nesting habitat for this species where four male Bobolinks were singing and performing display flights in the pastures. Point counts were conducted in potentially suitable Bobolink habitat along Warden Ave which includes an uncut pasture adjacent to the farm in the northwest corner along Elgin Mills Road and the uncut horse pastures between the two farms in the southeast corner along Warden Avenue.

Like the Bobolink, the Eastern Meadowlark is still a common species in southern Ontario. On the Berczy Glen Block, a single bird was flushed from the ground in one of the same pastures where the Bobolinks had been present. The individual flew a long-distance northeast across Warden Avenue until it was out of view, which suggests that this area was not part of its regular territory and it was unlikely to be breeding on the Berczy Glen Block.

The 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 on the Berczy Glen Block and Angus Glen Block. The other four species were Pileated Woodpecker, Black-billed Cuckoo (*Coccyzus erythropthalmus*), Brown Thrasher (*Toxostoma rufum*), Vesper Sparrow (*Pooecetes gramineus*), and Bobolink.

Brown Thrasher is a fairly common thicket species that are somewhat tolerant of disturbed areas. Two Brown Thrasher territories were found, one in thicket habitat along Berczy Creek, the other in a hedgerow among the agricultural fields. Vesper Sparrow, while not particularly common, is a species typically present in dry short-grass fields, short-grass pastures, and cultivated fields. Two Vesper Sparrow territories were observed in agricultural fields on the Berczy Glen Block. Bobolink is discussed above.

A total of seven species considered to be area-sensitive were recorded on the Berczy Glen Block and Angus Glen Block, however only four have suitable habitat within the Subject Lands. 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 four species include three grassland-sensitive species (Savannah Sparrow, Bobolink, and Eastern Meadowlark) and one forest-sensitive species (American Redstart). 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. While most forest-sensitive species all require extensive forest habitats in which to breed, they are all quite common in areas where such habitat is present. A single Redstart territory was located in a small, wooded area just south of the two water features near Warden Avenue, and part of its territory was likely located outside of the boundaries of the Subject Lands.

#### *3.2.2.5 Potential Bat Habitat*

In the early stages of the studies on the Berczy 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 thew Angus Glen MESP, that may provide bat maternity- and day- roosting habitat and are within the Subject Lands. The following areas were identified as having the potential to provide habitat:

- The CUP communities on the east central side of Warden Avenue within the Subject Lands;
- Cultural woodland community at northeast corner of the Subject Lands; and
- Forested community associated with the southern side of the Bruce Creek Tributary corridor.

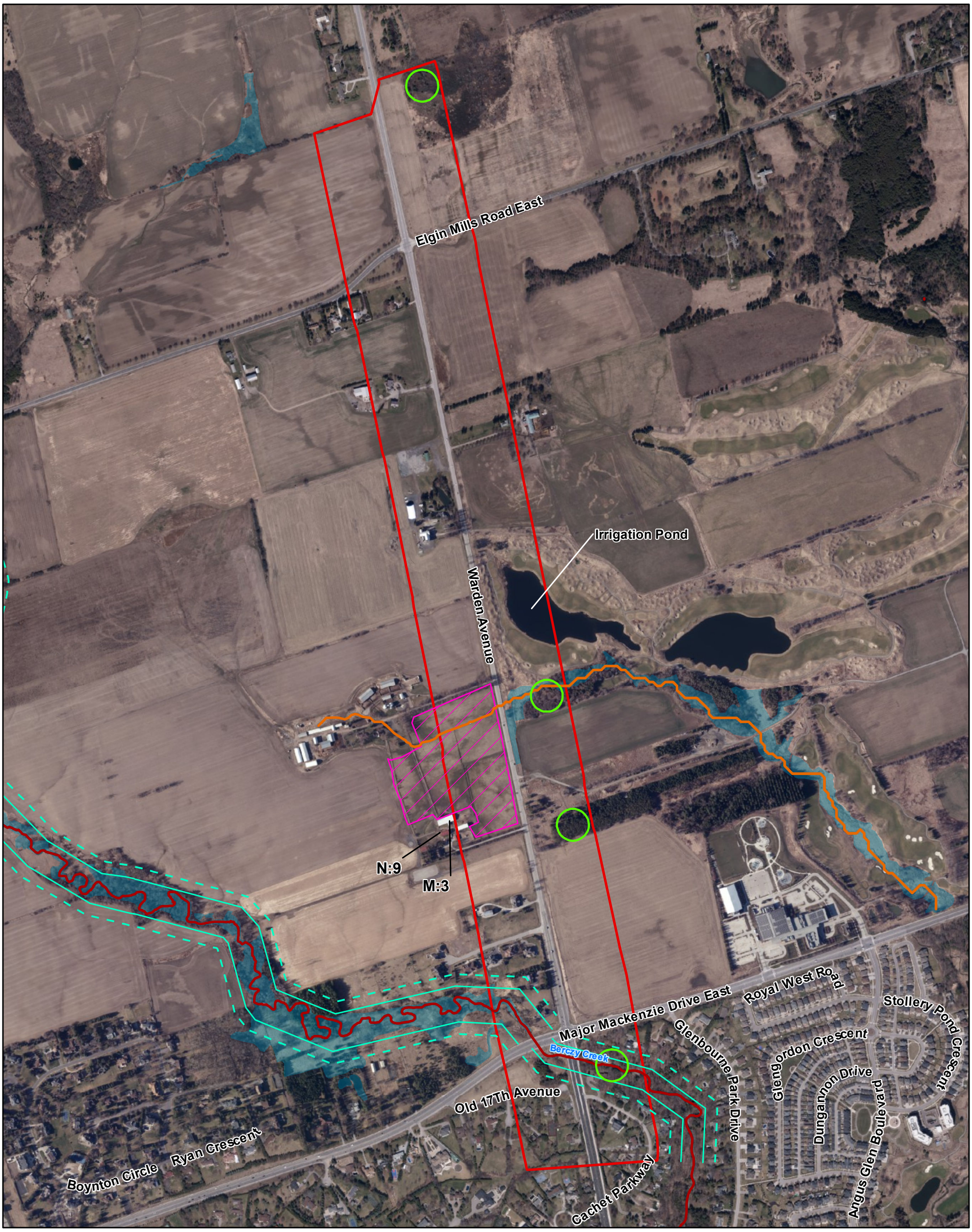
# 4. Designated Natural Heritage Features

## 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 three (3) HDFs. As a result, no further assessment is required for these HDFs;
- "Mitigation" management recommendations for five (5) HDFs; and
- "Protection" management recommendation for the open section of BR2-H15.

The SWS identified management recommendations for several HDFs within the Subject Lands are identified as "Mitigation". This includes HDFs BR2-H18, H16, H15, H15-A and H15-C. These HDFs are all drainage (tiled and open) systems that deliver flows to Bruce Creek Tributary at various locations along the tributary system within the Subject Lands. Note that HDF BR2-H15 has been assigned two management recommendations to reflect the piped and open sections. The piped section is designated "Mitigation" and the 135 m long open section is designated "Protection". Note that despite the designation of "Protection", this section of channel has been approved for realignment and improvement. The detailed design process considered the future improvements of Warden Avenue.




## Legend

- Subject Lands
- Potential Bat Habitat
- Provincially Significant Wetland (MNRF 2020)
- Suitable Bobolink and Eastern Meadowlark Nesting Habitat
- **B:3** Building Code: Number of Nesting Barn Swallow (2013)

### Regulated Redside Dace Habitat

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

**Species at Risk Habitat** | **Figure 4**

Warden Avenue Natural Environment Report

BEACON ENVIRONMENTAL

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## Table 2. Subwatershed Study Headwater Drainage Feature Recommendations

| ID | Feature Description | Flow Regime | SWS Management Recommendation |
|---|---|---|---|
| BR2-H18(3) | Tile drain and roadside ditch draining into golf course pond | Ephemeral | Mitigation |
| BR2-H16(2) | Open channel with ephemeral flows connected to a pond. Does not provide base flow or coarse sediment supply to downstream occupied habitat. | Ephemeral | Mitigation (within the Subject Lands) |
| BR2-H15 (open section) | Mainly buried feature that tile drains large area of field and outlets to this short open section. Perennial flow occurs along open reach. Perennial flow occurs along open reach. | Permanent | Reach with Protection status to be recreated immediately upstream of Warden Avenue. Clean water to be directed to new Protection reach via third pipe or similar. |
| BR2-H15 | Tile drainage from agricultural field | | Mitigation through LID BMPs and /or other measures to maintain function. |
| BR2-H15A | Tile drainage from agricultural field | Intermittent | Mitigation through LID BMPs and /or other measures to maintain function. |
| H15-C | Tile drainage from agricultural field | Intermittent | Mitigation through LID BMPs and /or other measures to maintain function. |

*Note: Table content from SWS Phase 3 Table 2.4.16 with exception that BR2-H15 has been broken into two reaches – the tile drain and open sections.*

As part of the HDF assessments completed for the MESPs, it was concluded that the hydrologic functions of these HDFs shall be replicated throughout the Subject Land (surrounding the Subject Lands). Furthermore, the HDF assessments concluded that BR2-H15 requires the realignment and improvement of the open portion of the drainage feature, the delivery of cool, clean Foundation Drainage to the realigned feature, and its integration with the SWM facilities planned within the Berczy Glen Block and Angus Glen Block.

Existing fisheries information for Berczy and Bruce Creeks was obtained from the Rouge River Watershed Fisheries Management Plan (TRCA and MNR draft 2011). Fish community sampling was not completed in Berczy Creek because of the presence of an Endangered fish species, Redside Dace and due to the abundance of background information. Sampling of the upstream headwater portion of the Bruce Creek Tributary was undertaken at the request of MNRF. Both Berczy Creek and Bruce Creek provide good quality fish habitat for all life stages including, spawning, rearing, feeding, refuge and migration for the several fish species identified. The natural heritage features and hydrologic features present are contained within the Berczy Creek valleyland and will be protected within the Greenway System. The functions of the Bruce Creek Tributary (BR2-H15) are to be protected.

The Redside Dace population in the Berczy Creek and Bruce Creek is considered one of the three most significant populations in Ecodistrict 7E4, and in Ecoregion 7E (MNRF 2017). The associated timing in water work timing window for Redside Dace habitat is between July 1 and September 15.

## 4.2 Habitat of Endangered or Threatened Species

### *4.2.1 Redside Dace*

Berczy 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.

Bruce Creek Tributary (BR2-H15) was identified as contributing Redside Dace habitat throughout the Subject Lands. According to MECP, this feature conveys baseflow to downstream reaches (i.e., the occupied habitat of Bruce Creek) and therefore the feature has been designated contributing Redside Dace habitat. The reaches of Berczy Creek that traverse the Subject Lands (under Major Mackenzie Drive East then under Warden Avenue) are designated as occupied Redside Dace habitat. Refer to **Figure 4** for habitat designations.

### *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. 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.

### 4.2.3 Bobolink and Eastern Meadowlark

Potential habitat for two bird species designated as threatened under the provincial ESA, and therefore are provided species and habitat protection under Section 9 and 10 of this legislation, was present within the Subject Lands. Although both species were observed during investigation, results were not conclusive enough to confirm the presence of breeding pairs within the Subject Lands. However, the presence of species within suitable nesting habitat identifies the requirement for breeding bird surveys, within the suitable nesting habitat, if impacts to the suitable habitat are anticipate based on future design phases.

### 4.2.4 Bat SAR

The significant woodlands associated with the Berczy 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. 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 included:

- 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 Berczy 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. Many forested communities (FOD, FOM, SWD, and SWM ecosites) are located throughout the Bruce-Berczy Creek Provincially Significant Wetland and associated with Berczy Creek valley and Bruce Creek Tributary corridor. Maternity colonies may be in deciduous or mixed forest stands with >10/ha large diameter (>25cm DBH) wildlife trees. The presence of bats will be determined through appropriate field surveys and in consultation with MECP where trees are proposed for removal.

Based on the review and conclusions outlined in the MESPs, no SWH has been confirmed within the Subject Land boundaries.

## 4.5 Provincially Significant Wetlands

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. 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. Berczy and Bruce Creek is designated occupied Redside Dace habitat through the Berczy and 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 the Berczy Glen Block and Angus Glen Block as part of the Bruce-Berczy Creek Provincially Significant Wetland (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 2** illustrates the portions of the Bruce-Berczy Creek PSW Complex on identified within the Subject Lands. The small inclusions of PSW are primarily associated with the upstream reach of the Berczy Creek crossing of Major Mackenzie Drive East and the Bruce Creek Tributary. The wetland habitat associated with Berczy Creek and the Bruce Creek Tributary are considered Redside Dace contributing habitat per Ontario Regulation 242/08.

## 4.6 Significant Woodlands

Significant woodlands are defined based on municipal Official Plan criteria that primarily include the application of size thresholds and proximity to other features. One of the City'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 KNHFs and KHFs (AMECFW SWS Report Phase 2 2017). For the Subject Lands, the applicable significant woodland criteria include:

- Size of 0.5 ha or larger;
- 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 PSW 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 Berczy Creek valley and the Bruce Creek Tributary corridor meet the test of “significance” by virtue of their proximity to Redside Dace habitat and because portions are considered part of the PSW.

### 4.7 Greenway System

The Greenway System was identified through the MESPs for the Berczy Glen and Angus Glen blocks. 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;
  - KNHFs and KHFs;
  - 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 *Migratory Birds Convention Act* (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 April to August, 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.

Berczy Creek and Bruce Creek Tributary are designated as Redside Dace habitat, therefore works within the regulated habitat (i.e., meander belt + 30 m for occupied and in water works for contributing features) 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 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) be necessary, fish and wildlife 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.

As discussed in Section 3.2.1.3, detailed designs for an enhanced BR2-H15 are currently under review with the regulatory agencies. The detailed design process considered the future improvements of Warden Avenue.

## 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.

Breeding bird surveys should be completed within the suitable nesting habitat for Bobolink and Eastern Meadowlark, 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 Berczy Creek is identified as occupied Redside Dace habitat. Reside Dace is listed as Endangered under Schedule 1 of the SARA. Effects to listed aquatic SAR, 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 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 confirmed impacts to SAR and SAR habitat identified in this report and future design phases, shall be complied with and obtained.

Berczy Creek is identified as occupied Redside Dace habitat. Habitat, as regulated under Section 10 of the ESA includes the meander belt width, plus 30 mon 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. Results of the meander belt assessment for the Berczy Creek (BE1A) crossing of Warden Avenue, determined that the meander belt width is 55 m. Additionally, the

Bruce Creek Tributary (BR2-H15) and its associated PSW has been designated contributing Redside Dace habitat. 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.

### *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 Bruce Creek Tributary and the Berczy Creek PSW 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 and Policies*

Berczy Creek, Bruce Creek Tributary, 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 to Warden Avenue 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 Berczy Creek and Bruce 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. *PSWs;*
2. *Suitable and/ or confirmed habitat of endangered and threatened species*
    a. *(Redside Dace: Berczy Creek, occupied; Bruce Creek Tributary and riparian wetlands, contributing)*
    b. *Barn Swallow*
    c. *Bobolink*
    d. *Potential SAR bat habitat;*
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, TRCA, MECP and DFO, as necessary.

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

Report prepared by:
**Beacon Environmental**
*pp*

Devon Fowler, B.Sc., Dipl. Eco. Restoration
Aquatic Ecologist

Report reviewed by:
**Beacon Environmental**

Carolyn Glass, B.Sc. M.E.S.
Senior Ecologist

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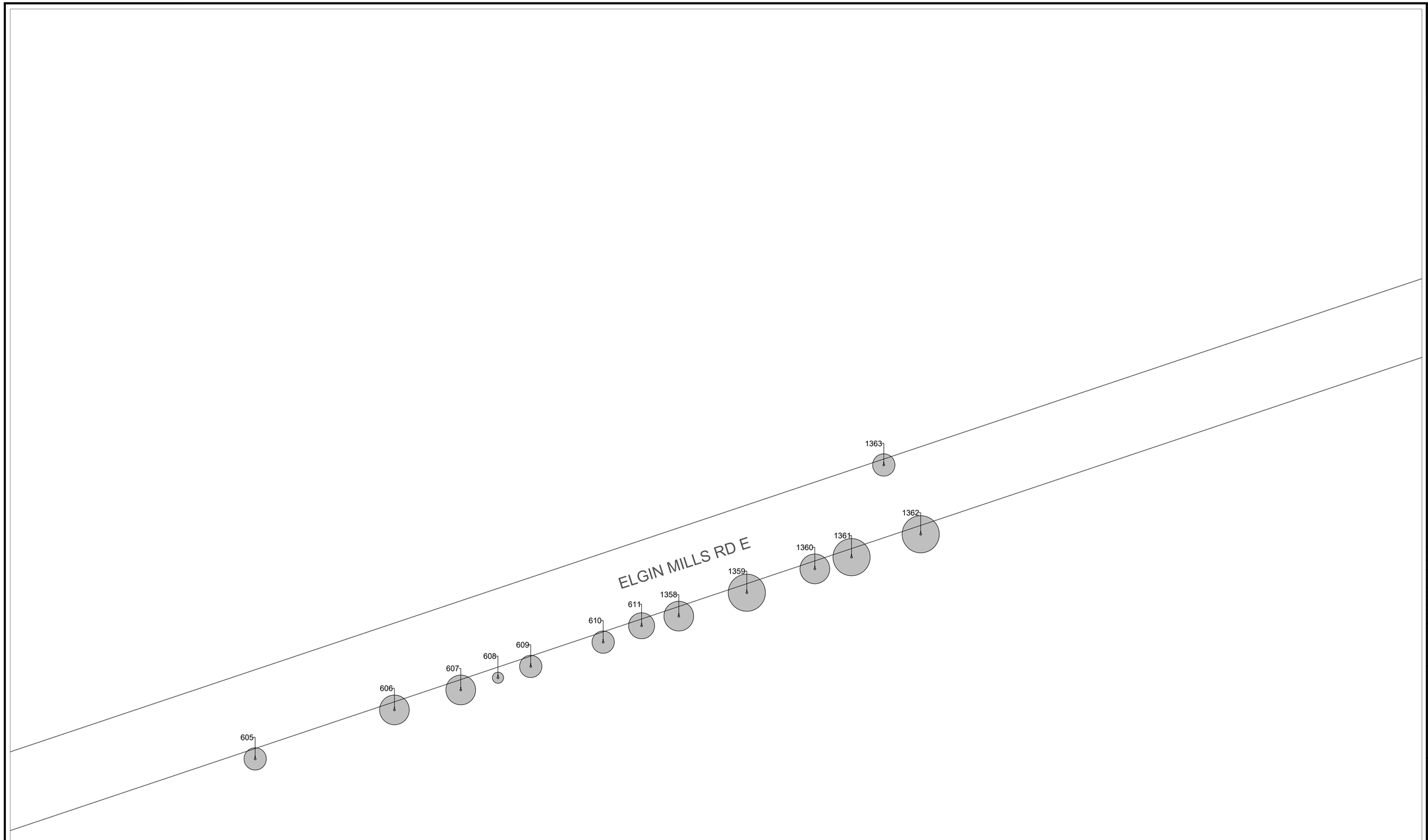
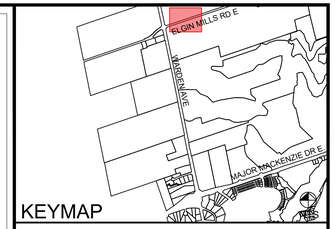
# Appendix A

## Tree Inventory




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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NORTH ARROW

NORTH

CERTIFIED ARBORIST ISA

SEVAN TORUS
#ON-1924A

BEACON ENVIRONMENTAL

CLIENT

REGIONAL MUNICIPALITY OF YORK

PROJECT

WARDEN AVENUE
TREE INVENTORY

SHEET TITLE

TREE INVENTORY PLAN

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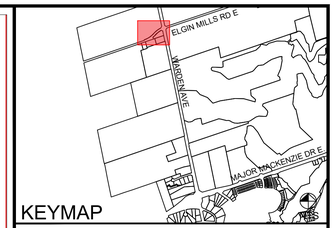
| DESIGN BY: -- | PROJECT Nº: 220329 |
| DRAWN BY: AD | FIGURE Nº: TP-1 |
| CHECKED BY: ST | |
| DATE: 25 April 2021 | |


KEYMAP




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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NORTH ARROW

North

CERTIFIED ARBORIST ISA

SEVAN TORUS
#ON-1924A

BEACON ENVIRONMENTAL

CLIENT

REGIONAL MUNICIPALITY OF YORK

PROJECT

WARDEN AVENUE
TREE INVENTORY

SHEET TITLE

TREE INVENTORY PLAN

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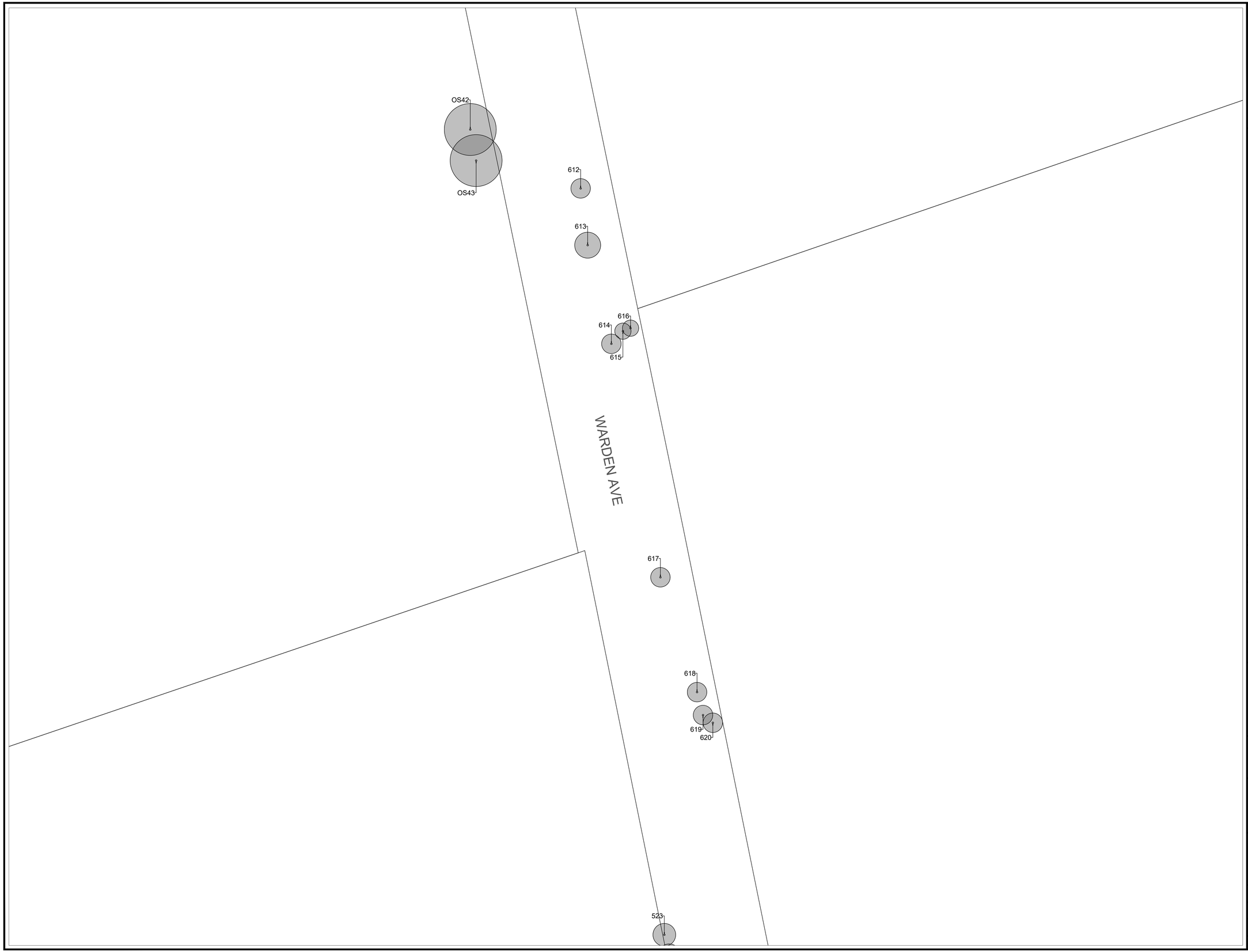


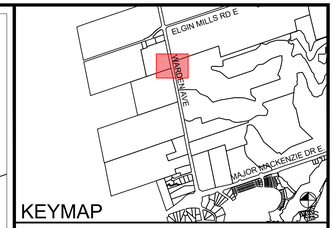


## LEGEND

1678 Tree tag

Tree Crown

Tree Location

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For illustrative purposes. Do not scale

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SEVAN TORUS
#ON-1924A

BEACON ENVIRONMENTAL

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REGIONAL MUNICIPALITY OF YORK

PROJECT

WARDEN AVENUE
TREE INVENTORY

SHEET TITLE

TREE INVENTORY PLAN

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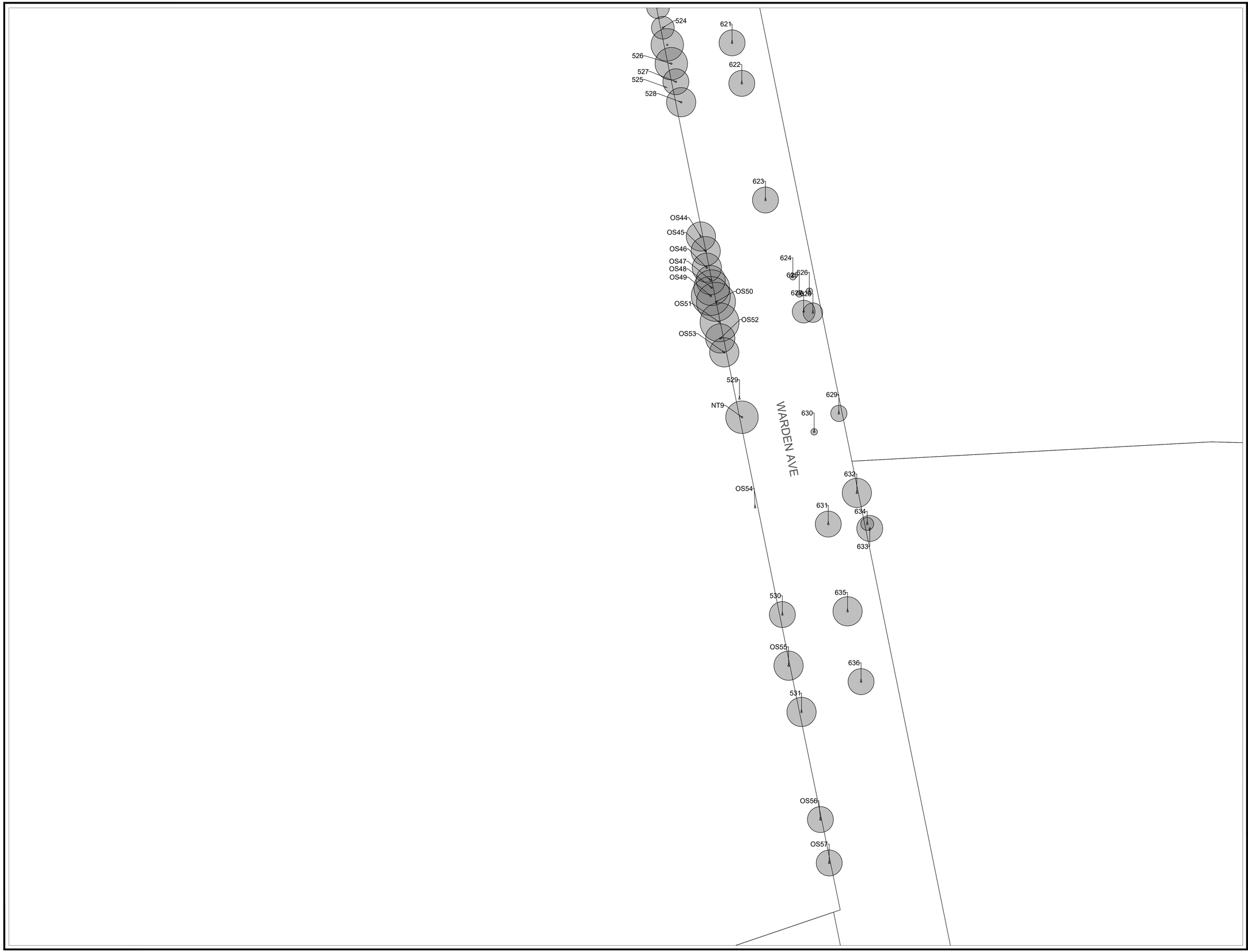


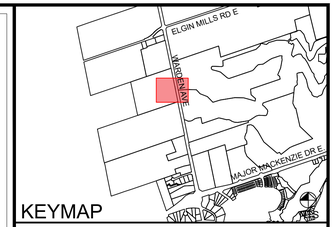


## LEGEND

1678 Tree tag

Tree Crown

Tree Location

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REGIONAL MUNICIPALITY OF YORK

PROJECT

WARDEN AVENUE
TREE INVENTORY

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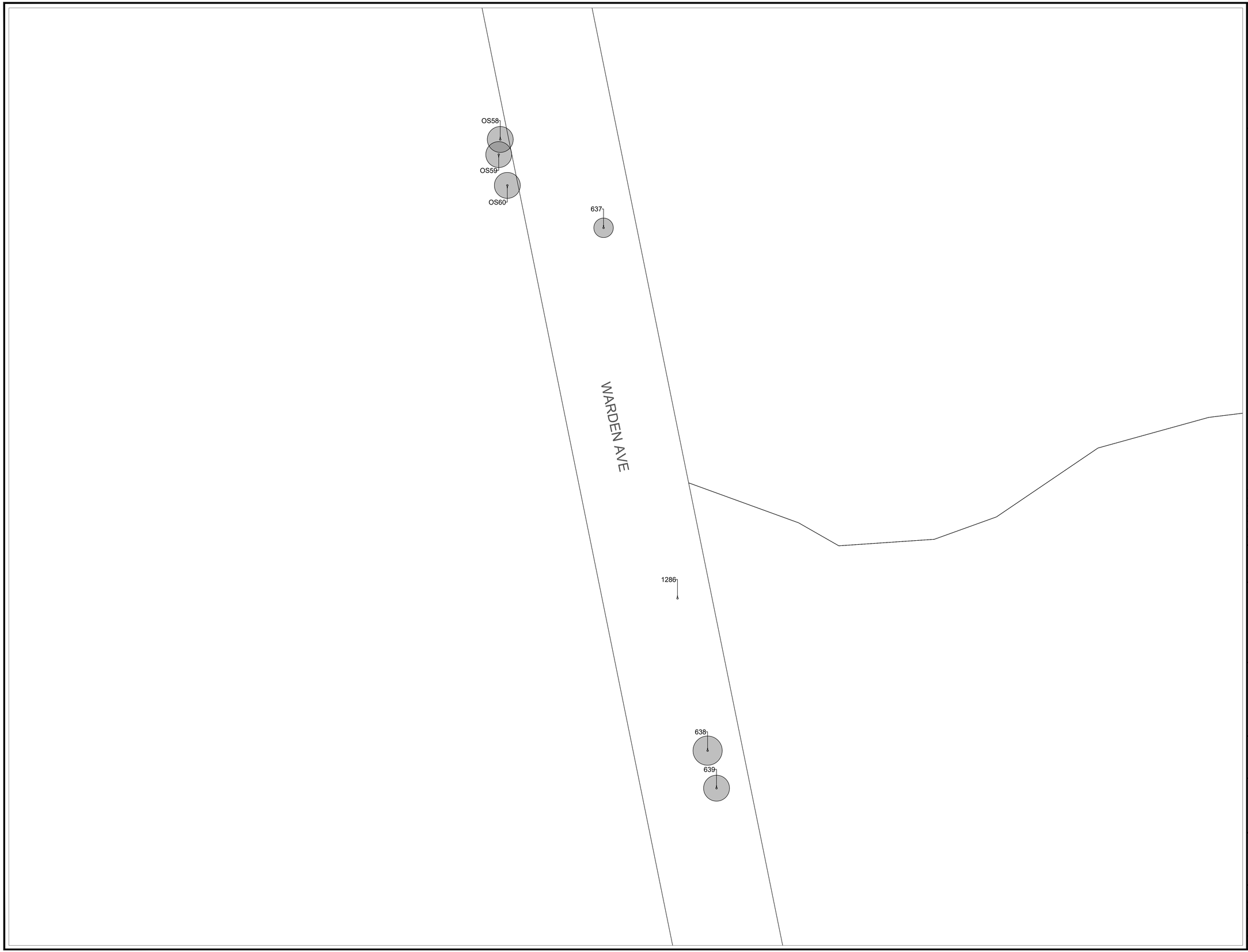


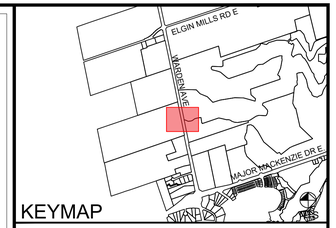


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SEVAN TORUS
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BEACON ENVIRONMENTAL

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REGIONAL MUNICIPALITY OF YORK

PROJECT

WARDEN AVENUE
TREE INVENTORY

SHEET TITLE

TREE INVENTORY PLAN

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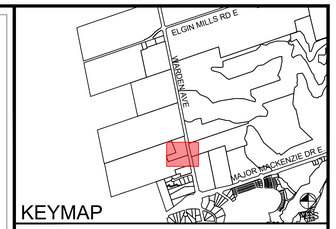


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REGIONAL MUNICIPALITY OF YORK

PROJECT

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TREE INVENTORY

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TREE INVENTORY PLAN

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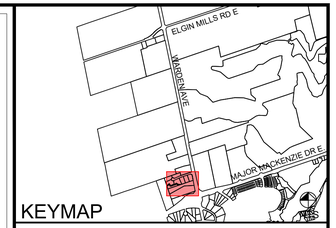


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Tree Crown

Tree Location

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SEVAN TORUS
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BEACON ENVIRONMENTAL

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REGIONAL MUNICIPALITY OF YORK

PROJECT

WARDEN AVENUE
TREE INVENTORY

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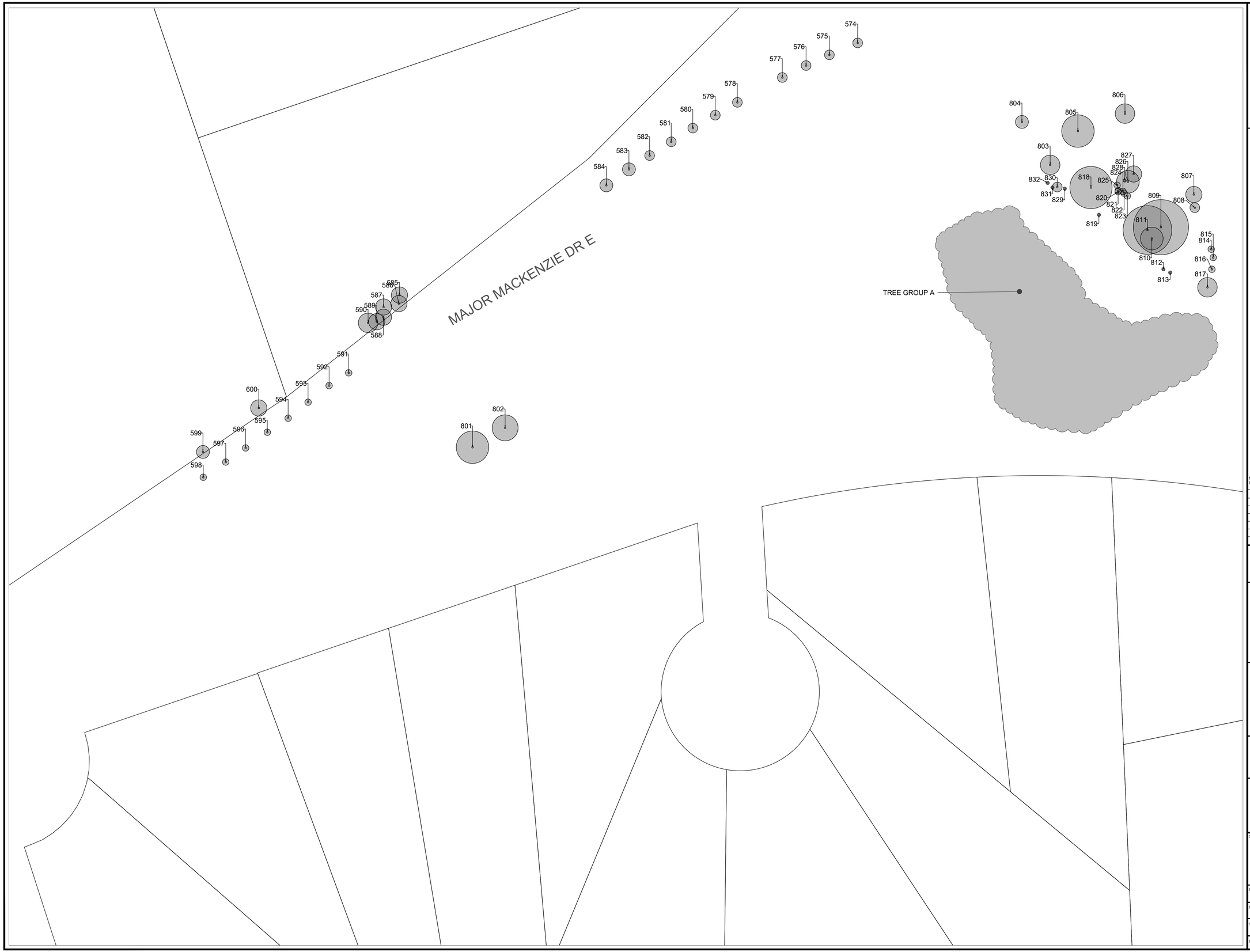


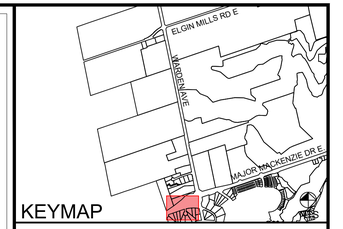


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NORTH ARROW

North

CERTIFIED ARBORIST ISA®

SEVAN TORUS
#ON-1924A

BEACON ENVIRONMENTAL

CLIENT

REGIONAL MUNICIPALITY OF YORK

PROJECT

WARDEN AVENUE
TREE INVENTORY

SHEET TITLE

TREE INVENTORY PLAN

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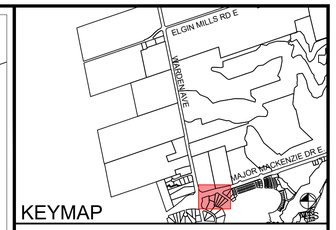
MAJOR MACKENZIE DR E

WARDEN AVE


## LEGEND

1678 Tree tag

Tree Crown

Tree Location

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For illustrative purposes. Do not scale

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NORTH ARROW

North

CERTIFIED ARBORIST ISA

SEVAN TORUS
#ON-1924A

BEACON ENVIRONMENTAL

CLIENT

REGIONAL MUNICIPALITY OF YORK

PROJECT

WARDEN AVENUE
TREE INVENTORY

SHEET TITLE

TREE INVENTORY PLAN

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| DESIGN BY: -- | PROJECT N°: 220329 |
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| DATE: 25 April 2021 | |

# TREE INVENTORY TABLE

| | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| 1 | Tag/Tree No. | Scientific Name | Common Name | DBH (cm) | Crown Diameter (m) | Condition[1] | Comments |
| 2 | 476 | Acer platanoides | Norway Maple | 23 | 5 | Fair-Good | Minor dieback and thinning; Evidence of past pruning. |
| 3 | 477 | Acer platanoides | Norway Maple | 35 | 7 | Fair-Good | Minor dieback and thinning; Evidence of past pruning; Uneven crown. |
| 4 | 478 | Acer platanoides | Norway Maple | 43 | 10 | Fair-Good | Minor dieback and thinning; Evidence of past pruning; Stems fork into two above breast height; Included bark at stem union; Adjacent utility lines. |
| 5 | 479 | Tilia americana | Basswood | 17, 15 | 6 | Fair | Stems fork near ground; Included bark at stem union; Multiple stems cut in past at ground; Epicormic shoots at base of tree and along trunk. |
| 6 | 480 | Acer platanoides | Norway Maple | 53 | 12 | Fair | Moderate dieback and thinning; Several dead branches; Insect damage to trunk and branches. |
| 7 | 481 | Acer platanoides | Norway Maple | 43 | 7 | Fair-Good | Minor dieback and thinning; Vertical frost crack along trunk; Insect damage to trunk and branches. |
| 8 | 482 | Acer platanoides | Norway Maple | 35 | 6 | Fair-Good | Minor dieback and thinning; Included bark at branch unions; Insect damage to trunk and branches. |
| 9 | 483 | Acer platanoides | Norway Maple | 33 | 6 | Fair | Moderate dieback and thinning; Damage to trunk flare; Included bark at branch unions; Lifting peeling bark on branches. |
| 10 | 484 | Acer platanoides | Norway Maple | 44 | 10 | Good | Included bark at branch unions; Some insect damage to trunk and branches. |
| 11 | 485 | Acer platanoides | Norway Maple | 38 | 7 | Good | Good form and vigour; Some insect damage to trunk. |
| 12 | 486 | Acer x freemanii | Freeman's Maple | 55 | 14 | Fair-Good | Relatively healthy crown; Exposed wound with Rotting woundwood at base of tree. |
| 13 | 487 | Acer saccharum | Sugar Maple | 30 | 6 | Good | Good form and vigour; Relatively small crown. |
| 14 | 488 | Acer platanoides | Norway Maple | 48 | 12 | Good | Good form and vigour. |
| 15 | 489 | Acer x freemanii | Freeman's Maple | 56 | 13 | Fair-Good | Healthy even crown; Rotting cavity at base of tree. |
| 16 | 490 | Acer platanoides | Norway Maple | 42 | 12 | Fair | Moderate dieback and thinning; Insect damage to trunk and branches. |
| 17 | 491 | Acer platanoides | Norway Maple | 51 | 12 | Good | Good form and vigour; Included bark at stem unions; Some insect damage to trunk. |
| 18 | 492 | Acer platanoides | Norway Maple | 42 | 12 | Fair-Good | Some dead interior branches; Fuit even crown. |
| 19 | 493 | Acer platanoides | Norway Maple | 33 | 6 | Poor | Significant dieback and thinning; Crown lowered; Vertical split along length of the trunk. |
| 20 | 494 | Acer platanoides | Norway Maple | 60 | 12 | Fair-Good | Minor dieback and thinning; Some dead branches; Insect damage to trunk and branches. |
| 21 | 495 | Acer platanoides | Norway Maple | 44 | 12 | Fair | Relatively healthy crown; Large rotting wound and cavity surrounding the base of tree. |
| 22 | 496 | Acer platanoides | Norway Maple | 31 | 8 | Good | Healthy crown; Some trimmer damage to trunk flare. |
| 23 | 497 | Acer saccharum | Sugar Maple | 42 | 12 | Good | Good form and vigour. |
| 24 | 498 | Acer platanoides | Norway Maple | 50 | 10 | Good | Good vigour; Vertical seam along trunk due to wind exposure. |
| 25 | 499 | Acer saccharum | Sugar Maple | 53 | 10 | Fair-Good | Minor dieback and dead branches. |
| 26 | 500 | Acer platanoides | Norway Maple | 48 | 12 | Good | Good form and vigour; Included bark at branch unions; Some insect damage to trunk and branches. |
| 27 | 501 | Acer saccharum | Sugar Maple | 43 | 9 | Good | Good vigour; Uneven crown. |
| 28 | 502 | Acer saccharum | Sugar Maple | 46 | 7 | Good | Relatively small crown; Stem forks into multiple stems ~ 2.5 m from ground; Included bark at stem unions. |
| 29 | 503 | Acer platanoides | Norway Maple | 47 | 12 | Good | Good form and vigour; Some insect damage to trunk and branches. |
| 30 | 504 | Acer saccharum | Sugar Maple | 56 | 12 | Good | Good form and vigour; Some insect damage to trunk. |
| 31 | 505 | Acer platanoides | Norway Maple | 41 | 10 | Good | Good form and vigour; Some insect damage to trunk. |
| 32 | 506 | Acer saccharum | Sugar Maple | 41 | 10 | Good | Minor insect damage to trunk and branches; Good vigour and form. |
| 33 | 507 | Acer platanoides | Norway Maple | 43 | 12 | Fair-Good | Relatively healthy crown; Large vertical wound with woundwood along trunk; Insect damage to trunk and branches. |
| 34 | 508 | Acer platanoides | Norway Maple | 31 | 10 | Fair-Good | Relatively healthy crown; Large vertical wound with rotting woundwood along trunk; Some insect damage to trunk and branches. |
| 35 | 509 | Acer platanoides | Norway Maple | 38 | 10 | Good | Good vigour; Uneven crown with load on south side of tree. |
| 36 | 510 | Acer saccharum | Sugar Maple | 39 | 8 | Good | Good vigour; Suppressed on west side of tree; Some insect damage to trunk and branches. |
| 37 | 511 | Acer saccharum | Sugar Maple | 37 | 10 | Good | Good form and vigour; Minor insect damage to trunk. |
| 38 | 512 | Acer platanoides | Norway Maple | 48 | 14 | Good | Good form and vigour; Minor insect damage to trunk and branches. |
| 39 | 513 | Acer platanoides | Norway Maple | 49 | 14 | Poor-Fair | Moderate to significant dieback and thinning; Large pruned branches; Uneven crown; Tree is declining in health. |
| 40 | 514 | Acer platanoides | Norway Maple | 36 | 8 | Good | Good vigour; Trunk twisted due to wind exposure; Some insect damage to trunk and branches. |
| 41 | 515 | Acer platanoides | Norway Maple | 61 | 16 | Fair-Good | Large even crown; Minor dieback and thinning; Some insect damage to trunk and branches. |
| 42 | 516 | Fagus sp. | Beech Cultivar | 7 | 2 | Good | Good form and vigour. |
| 43 | 517 | Syringa reticulata | Japanese Lilac | 9 | 2 | Good | Good form and vigour. |
| 44 | 518 | Syringa reticulata | Japanese Lilac | 14 | 3 | Good | Good form and vigour. |
| 45 | 519 | Syringa reticulata | Japanese Lilac | 17 | 3 | Good | Good form and vigour. |
| 46 | 520 | Syringa reticulata | Japanese Lilac | 9 | 2 | Good | Good form and vigour. |
| 47 | 521 | Syringa reticulata | Japanese Lilac | 19 | 4 | Good | Good form and vigour. |
| 48 | 522 | Fagus sp. | Beech Cultivar | 6, 6 | 3 | Good | Good form and vigour; Included bark at stem union; Slight lean towards the south. |
| 49 | 523 | Acer x freemanii | Freeman's Maple | 53 | 7 | Poor | Significant dieback and thinning; Trunk completely hollow and with decay. |
| 50 | 524 | Acer x freemanii | Freeman's Maple | 50 | 7 | Poor | Tree almost dead; Trunk hollow with black rot Significant dieback and thinning. |
| 51 | 525 | Acer x freemanii | Freeman's Maple | 49 | 10 | Poor-Fair | Tree declining in health; Main stem dead; hollow and in a state of decay. |
| 52 | 526 | Acer x freemanii | Freeman's Maple | 61 | 10 | Fair | Moderate dieback and thinning; Cavities along trunk and on trunk flare. |
| 53 | 527 | Acer x freemanii | Freeman's Maple | 54 | 8 | Poor | Tree almost dead; Leader of tree dead and in a state of decay. |
| 54 | 528 | Acer x freemanii | Freeman's Maple | 60 | 9 | Poor-Fair | Tree declining in health; Significant dieback and thinning; One of two stems dead and rotting. |
| 55 | 529 | Acer saccharum | Sugar Maple | 48 | NA | Dead | Standing snag; Potential risk tree; Sign bracket attached to tree trunk. |
| 56 | 530 | Acer saccharum | Sugar Maple | 78 | 8 | Poor | Significant dieback and thinning; Trunk base primarily hollow; Fungal fruiting bodies; Uneven crown with live branches and load on west side of tree; Potential risk tree. |
| 57 | 531 | Acer saccharum | Sugar Maple | 64 | 9 | Poor-Fair | Tree declining in health; Significant dieback and thinning; Cavities at previous branch attachments. |
| 58 | 532 | Malus sp. | Apple | 25, 27 | 10 | Fair | Moderate dieback and thinning; Epicormic shoots; Stems fork near ground; Included bark at stem union. |
| 59 | 533 | Tilia cordata | Littleleaf Linden | 23 | 6 | Good | Good vigour; Relatively short tree; Some insect damage to trunk. |
| 60 | 534 | Tilia cordata | Littleleaf Linden | 34 | 6 | Good | Good vigour; Relatively short tree; Some insect damage to trunk; Slight lean towards the east. |
| 61 | 535 | Malus sp. | Apple | 48 | 7 | Fair-Good | Stems fork just above breast height; Minor epicormic growth; Cavity at one of two stem unions. |
| 62 | 536 | Acer saccharum | Sugar Maple | 61 | 8 | Poor | Significant dieback and thinning; Large diameter dead branches; Missing and peeling bark; Leader snapped. |
| 63 | 537 | Acer saccharum | Sugar Maple | 83 | 14 | Fair | Moderate dieback and thinning; Discoloration of bark; Several dead branches. |
| 64 | 538 | Quercus macrocarpa | Bur Oak | 30 | 8 | Good | Good form and vigour. |
| 65 | 539 | Quercus macrocarpa | Bur Oak | 32 | 8 | Good | Good form and vigour. |
| 66 | 540 | Quercus macrocarpa | Bur Oak | 18 | 7 | Good | Good form and vigour. |
| 67 | 541 | Acer platanoides | Norway Maple | 39 | 10 | Good | Good form and vigour; Minor insect damage to trunk and branches. |
| 68 | 542 | Acer platanoides | Norway Maple | 26, 27 | 10 | Good | Stems fork below breast height; Included bark at stem union; Some insect damage to trunk and branches. |
| 69 | 543 | Ulmus pumila | Siberian Elm | 33 | 8 | Fair | Moderate dieback and thinning; Several dead branches. |
| 70 | 544 | Ulmus pumila | Siberian Elm | 22 | 5 | Fair | Moderate dieback and thinning; Several dead branches. |
| 71 | 545 | Ulmus pumila | Siberian Elm | 43 | 8 | Fair | Moderate dieback and thinning; Several dead branches. |
| 72 | 546 | Syringa reticulata | Japanese Lilac | 18 | 3 | Good | Good form and vigour. |
| 73 | 547 | Syringa reticulata | Japanese Lilac | 13 | 3 | Good | Good form and vigour; Minor trunk damage. |
| 74 | 548 | Picea glauca | White Spruce | 4 | 5 | Good | Needles and branches limited to very top of the tree. |
| 75 | 549 | Syringa reticulata | Japanese Lilac | 19 | 3 | Good | Good form and vigour; Trimmer damage to trunk. |
| 76 | 550 | Syringa reticulata | Japanese Lilac | 19 | 4 | Good | Good form and vigour. |
| 77 | 551 | Picea glauca | White Spruce | 3 | 0.5 | Good | Branches and needles limited to very top of tree. |
| 78 | 552 | Syringa reticulata | Japanese Lilac | 16 | 4 | Good | Good form and vigour. |
| 79 | 553 | Syringa reticulata | Japanese Lilac | 16 | 3 | Good | Good form and vigour; Minor damage to trunk flare. |
| 80 | 554 | Picea glauca | White Spruce | 6 | 2 | Fair | Moderate thinning and chlorosis of needles. |
| 81 | 555 | Picea glauca | White Spruce | 8 | 2 | Fair-Good | Minor dieback and chlorosis of needles. |
| 82 | 556 | Picea glauca | White Spruce | 7 | 2 | Fair-Good | Minor dieback and chlorosis of needles. |
| 83 | 557 | Picea glauca | White Spruce | 5 | 2 | Fair-Good | Minor dieback and chlorosis of needles. |
| 84 | 558 | Picea glauca | White Spruce | 5 | 2 | Fair-Good | Minor dieback and chlorosis of needles. |
| 85 | 559 | Picea glauca | White Spruce | 8 | 2 | Fair-Good | Minor dieback and chlorosis of needles. |
| 86 | 560 | Picea glauca | White Spruce | 6 | 2 | Fair-Good | Minor dieback and chlorosis of needles. |
| 87 | 561 | Picea glauca | White Spruce | 6 | 2 | Fair-Good | Minor dieback and chlorosis of needles. |
| 88 | 562 | Picea glauca | White Spruce | 6 | 2 | Fair | Moderate dieback and chlorosis of needles. |
| 89 | 563 | Picea glauca | White Spruce | 6 | 2 | Fair | Moderate dieback and chlorosis of needles. |
| 90 | 564 | Picea glauca | White Spruce | 5 | 2 | Fair | Moderate dieback and chlorosis of needles. |
| 91 | 565 | Acer negundo | Manitoba Maple | 2 | 1 | Good | Good form and vigour. |
| 92 | 566 | Acer negundo | Manitoba Maple | 7, 5, 9 | 4 | Good | Good vigour; Stems fork near ground. |
| 93 | 567 | Ulmus americana | American Elm | 8 | 3 | Good | Good form and vigour. |
| 94 | 568 | Salix alba | White Willow | 44 | 12 | Fair | Moderate dieback and thinning; Adjacent to large culvert. |
| 95 | 569 | Salix alba | White Willow | 39 | 12 | Fair | Moderate dieback and thinning; Adjacent to large culvert. |
| 96 | 570 | Gleditsia triacanthos var inermis | Thornless Honeylocust | 8 | 3 | Good | Good form and vigour. |
| 97 | 571 | Gleditsia triacanthos var inermis | Thornless Honeylocust | 8 | 3 | Good | Good form and vigour. |
| 98 | 572 | Gleditsia triacanthos var inermis | Thornless Honeylocust | 9 | 3 | Fair-Good | Good vigour; Wound with woundwood on trunk. |
| 99 | 573 | Gleditsia triacanthos var inermis | Thornless Honeylocust | 8 | 3 | Fair-Good | Several wounds with woundwood along trunk. |
| 100 | 574 | Acer x freemanii | Freeman's Maple | 9 | 3 | Fair-Good | Good vigour; Several wounds with woundwood along trunk. |
| 101 | 575 | Acer x freemanii | Freeman's Maple | 8 | 3 | Good | Good vigour; Damage to trunk flare. |
| 102 | 576 | Acer x freemanii | Freeman's Maple | 7 | 3 | Good | Good vigour; Two wounds with woundwood along trunk. |
| 103 | 577 | Acer x freemanii | Freeman's Maple | 7 | 3 | Good | Good vigour; Two wounds with woundwood along trunk. |
| 104 | 578 | Acer x freemanii | Freeman's Maple | 7 | 3 | Good | Good vigour; Damage to trunk flare. |
| 105 | 579 | Acer x freemanii | Freeman's Maple | 7 | 3 | Good | Good vigour; Damage to trunk flare. |
| 106 | 580 | Gleditsia triacanthos var inermis | Thornless Honeylocust | 8 | 3 | Good | Good vigour; Damage to trunk flare. |
| 107 | 581 | Gleditsia triacanthos var inermis | Thornless Honeylocust | 8 | 3 | Good | Good vigour; Damage to trunk flare. |
| 108 | 582 | Gleditsia triacanthos var inermis | Thornless Honeylocust | 8 | 3 | Good | Good vigour; Damage to trunk flare. |
| 109 | 583 | Gleditsia triacanthos var inermis | Thornless Honeylocust | 10 | 4 | Good | Good vigour; Damage to trunk flare. |
| 110 | 584 | Gleditsia triacanthos var inermis | Thornless Honeylocust | 8 | 4 | Good | Good vigour; Damage to trunk flare. |
| 111 | 585 | Pinus sylvestris | Scots Pine | 13 | 5 | Fair | Stem broken and tree bending into Regional ROW; Needles still green and crown healthy. |
| 112 | 586 | Pinus sylvestris | Scots Pine | 16 | 5 | Good | Good form and vigour. |
| 113 | 587 | Pinus sylvestris | Scots Pine | 10 | 5 | Fair-Good | Stem growing horizontally into Regional ROW; Good vigour. |
| 114 | 588 | Pinus sylvestris | Scots Pine | 14 | 5 | Good | Good form and vigour. |
| 115 | 589 | Pinus sylvestris | Scots Pine | 11, 11 | 5 | Good | Stems fork at ground. |
| 116 | 590 | Pinus sylvestris | Scots Pine | 22 | 6 | Good | Good form and vigour. |
| 117 | 591 | Gleditsia triacanthos var inermis | Thornless Honeylocust | 7 | 2 | Good | Good form and vigour. |
| 118 | 592 | Gleditsia triacanthos var inermis | Thornless Honeylocust | 6 | 2 | Good | Good form and vigour. |
| 119 | 593 | Gleditsia triacanthos var inermis | Thornless Honeylocust | 7 | 2 | Good | Good form and vigour. |
| 120 | 594 | Gleditsia triacanthos var inermis | Thornless Honeylocust | 7 | 2 | Good | Good form and vigour. |
| 121 | 595 | Gleditsia triacanthos var inermis | Thornless Honeylocust | 4 | 2 | Good | Good form and vigour. |
| 122 | 596 | Gleditsia triacanthos var inermis | Thornless Honeylocust | 7 | 2 | Good | Good form and vigour. |
| 123 | 597 | Gleditsia triacanthos var inermis | Thornless Honeylocust | 7 | 2 | Good | Good form and vigour. |
| 124 | 598 | Gleditsia triacanthos var inermis | Thornless Honeylocust | 6 | 2 | Good | Good form and vigour. |
| 125 | 599 | Pinus sylvestris | Scots Pine | 16 | 4 | Good | Good form and vigour. |
| 126 | 600 | Pinus sylvestris | Scots Pine | 20, 17 | 5 | Good | Good form and vigour; Stems fork near ground. |
| 127 | 601 | Aesculus hippocastanum | Horsechestnut | 26 | 5 | Fair-Good | |
| 128 | 602 | Aesculus hippocastanum | Horsechestnut | 22 | 4 | Fair | |
| 129 | 603 | Gleditsia triacanthos var inermis | Thornless Honeylocust | 18 | 5 | Fair-Good | |
| 130 | 604 | Gleditsia triacanthos var inermis | Thornless Honeylocust | 23 | 7 | Fair-Good | |
| 131 | 605 | Acer x freemanii | Freeman's Maple | 45 | 6 | Fair | |
| 132 | 606 | Acer x freemanii | Freeman's Maple | 54 | 8 | Fair-Good | |
| 133 | 607 | Acer x freemanii | Freeman's Maple | 63 | 8 | Fair-Good | |
| 134 | 608 | Acer platanoides | Norway Maple | 18 | 3 | Poor | |
| 135 | 609 | Acer platanoides | Norway Maple | 25 | 6 | Fair-Good | |
| 136 | 610 | Acer platanoides | Norway Maple | 29 | 6 | Fair-Good | |
| 137 | 611 | Acer platanoides | Norway Maple | 41 | 7 | Fair-Good | |
| 138 | 612 | Acer x freemanii | Freeman's Maple | 42 | 6 | Fair-Good | |
| 139 | 613 | Acer x freemanii | Freeman's Maple | 53 | 6 | Good | |
| 140 | 614 | Acer x freemanii | Freeman's Maple | 52 | 6 | Fair | |
| 141 | 615 | Pinus sylvestris | Scots Pine | 45 | 5 | Good | |
| 142 | 616 | Pinus sylvestris | Scots Pine | 39 | 5 | Good | |
| 143 | 617 | Acer platanoides | Norway Maple | 37 | 6 | Good | |
| 144 | 618 | Acer platanoides | Norway Maple | 37 | 6 | Good | |
| 145 | 619 | Acer platanoides | Norway Maple | 29 | 6 | Fair-Good | |
| 146 | 620 | Acer platanoides | Norway Maple | 36 | 6 | Good | |
| 147 | 621 | Acer platanoides | Norway Maple | 54 | 8 | Good | |
| 148 | 622 | Acer platanoides | Norway Maple | 39 | 8 | Fair-Good | |
| 149 | 623 | Acer platanoides | Norway Maple | 54 | 8 | Good | |
| 150 | 624 | Juglans nigra | Black Walnut | 9 | 2 | Good | |
| 151 | 625 | Acer negundo | Manitoba Maple | 5 | 2 | Good | |
| 152 | 626 | Juglans nigra | Black Walnut | 3, 2, 2 | 2 | Good | |
| 153 | 627 | Acer negundo | Manitoba Maple | 15, 13, 12 | 7 | Good | |
| 154 | 628 | Acer negundo | Manitoba Maple | 21, 13, 11, 9 | 6 | Good | |
| 155 | 629 | Acer negundo | Manitoba Maple | 19, 14, 11 | 5 | Fair-Good | Growing into fence. |
| 156 | 630 | Juglans nigra | Black Walnut | 15 | 2 | Good | |
| 157 | 631 | Acer platanoides | Norway Maple | 55, 27 | 8 | Good | |
| 158 | 632 | Pinus nigra | Austrian Pine | 62 | 9 | Good | |
| 159 | 633 | Pinus nigra | Austrian Pine | 59 | 8 | Good | |
| 160 | 634 | Acer platanoides | Norway Maple | 15 | 4 | Good | |
| 161 | 635 | Acer platanoides | Norway Maple | 52 | 9 | Fair-Good | |
| 162 | 636 | Acer platanoides | Norway Maple | 48 | 8 | Fair-Good | |
| 163 | 637 | Acer platanoides | Norway Maple | 36 | 6 | Fair-Good | |
| 164 | 638 | Acer x freemanii | Freeman's Maple | 74 | 9 | Fair | Branch dieback. |
| 165 | 639 | Acer x freemanii | Freeman's Maple | 70 | 8 | Fair-Good | |
| 166 | 640 | Picea glauca | White Spruce | 43 | 6 | Fair | |
| 167 | 641 | Picea glauca | White Spruce | 33 | 6 | Fair-Good | |
| 168 | 642 | Pinus sylvestris | Scots Pine | 44 | 5 | Fair | |
| 169 | 643 | Pinus sylvestris | Scots Pine | 37 | 6 | Fair | |
| 170 | 644 | Picea glauca | White Spruce | 25 | 4 | Poor-Fair | |
| 171 | 645 | Crataegus sp. | Hawthorn | 30, 27 | 6 | Fair-Good | |
| 172 | 646 | Aesculus hippocastanum | Horsechestnut | 42, 43, 38 | 6 | Poor | |
| 173 | 647 | Aesculus hippocastanum | Horsechestnut | 49 | 5 | Poor-Fair | |
| 174 | 648 | Aesculus hippocastanum | Horsechestnut | 17, 16 | 2 | Poor | |
| 175 | 649 | Acer saccharum | Sugar Maple | 78 | 6 | Poor | |
| 176 | 650 | Acer saccharum | Sugar Maple | 81 | 6 | Poor | |
| 177 | 651 | Ulmus americana | American Elm | 32, 16 | 6 | Fair-Good | |
| 178 | 652 | Acer saccharum | Sugar Maple | 13 | 2 | Good | |
| 179 | 653 | Acer saccharum | Sugar Maple | 24, 14, 14 | 6 | Fair-Good | |
| 180 | 654 | Acer saccharum | Sugar Maple | 13, 9 | 2 | Fair-Good | |
| 181 | 655 | Acer saccharum | Sugar Maple | 56 | 8 | Good | |
| 182 | 656 | Acer saccharum | Sugar Maple | 50 | 6 | Good | |
| 183 | 657 | Tilia americana | Basswood | 65 | 6 | Fair-Good | |
| 184 | 658 | Picea abies | Norway Spruce | 28 | 5 | Fair-Good | |
| 185 | 659 | Picea glauca | White Spruce | 30 | 4 | Good | |
| 186 | 660 | Picea abies | Norway Spruce | 26 | 4 | Good | |
| 187 | 661 | Picea glauca | White Spruce | 29 | 4 | Good | |
| 188 | 662 | Picea glauca | White Spruce | 21 | 4 | Fair-Good | |
| 189 | 663 | Acer saccharum | Sugar Maple | 28, 22, 12 | 4 | Fair | |
| 190 | 664 | Thuja occidentalis | Eastern White Cedar | 30, 24, 29, 24, 14 | 6 | Fair-Good | |
| 191 | 665 | Picea glauca | White Spruce | 26 | 4 | Good | |
| 192 | 666 | Picea glauca | White Spruce | 21 | 2 | Good | |
| 193 | 667 | Picea glauca | White Spruce | 36 | 6 | Good | |
| 194 | 668 | Picea glauca | White Spruce | 40 | 6 | Good | |
| 195 | 669 | Picea glauca | White Spruce | 33 | 4 | Good | |
| 196 | 670 | Picea glauca | White Spruce | 33 | 4 | Good | |
| 197 | 671 | Malus sp. | Apple | 21, 17 | 4 | Poor-Fair | |
| 198 | 672 | Picea abies | Norway Spruce | 29 | 4 | Fair-Good | |
| 199 | 673 | Tilia americana | Basswood | 54, 29, 40 | 8 | Fair | |
| 200 | 674 | Pinus nigra | Austrian Pine | 38 | 4 | Good | |
| 201 | 675 | Picea glauca | White Spruce | 41 | 6 | Good | |
| 202 | 676 | Pinus nigra | Austrian Pine | 29 | 2 | Good | |
| 203 | 677 | Pinus nigra | Austrian Pine | 39 | 6 | Good | |
| 204 | 678 | Pinus nigra | Austrian Pine | 38 | 4 | Good | |
| 205 | 679 | Pinus nigra | Austrian Pine | 36 | 6 | Good | |
| 206 | 680 | Pinus nigra | Austrian Pine | 42 | 4 | Good | |
| 207 | 681 | Acer saccharum | Sugar Maple | 22 | 4 | Good | |
| 208 | 682 | Malus sp. | Apple | 41 | 6 | Fair-Good | |
| 209 | 683 | Fraxinus americana | White Ash | 32, 21 | 4 | Poor | |
| 210 | 684 | Tilia americana | Basswood | 28, 22, 18, 27, 23, 17 | 6 | Fair-Good | |
| 211 | 685 | Malus sp. | Apple | 43 | 6 | Poor | |
| 212 | 686 | Malus sp. | Apple | 34, 34 | 6 | Poor | |
| 213 | 801 | Acer platanoides | Norway Maple | 35 | 10 | Fair-Good | Minor dieback and thinning; Some insect damage. |
| 214 | 802 | Acer platanoides | Norway Maple | 29 | 8 | Fair-Good | Good form and vigour. |
| 215 | 803 | Salix alba | White Willow | 18, 28, 9 | 6 | Fair | Stems fork below breast height; Included bark; Moderate dieback and thinning. |
| 216 | 804 | Acer negundo | Manitoba Maple | 8, 7, 5, 5 | 4 | Fair-Good | Good form and vigour. |
| 217 | 805 | Acer negundo | Manitoba Maple | 28, 18, 16, 17, 17, 20, 16, 20 | 10 | Fair-Good | Moderate dieback and thinning; Stems fork below breast height; Located on remnant bridge. |
| 218 | 806 | Acer negundo | Manitoba Maple | 22, 7, 5 | 6 | Fair-Good | Minor dieback and thinning; Stems fork at ground. |
| 219 | 807 | Fraxinus americana | White Ash | 10, 8, 8, 5 | 5 | Poor | Tree almost dead as a result of infestation from EAB. |
| 220 | 808 | Acer negundo | Manitoba Maple | 9, 4 | 3 | Good | Good form and vigour. |
| 221 | 809 | Acer negundo | Manitoba Maple | 96 | 17 | Fair | Moderate dieback and thinning; Dead branches; One large fallen stem. |
| 222 | 810 | Juglans nigra | Black Walnut | 20 | 7 | Fair-Good | Good form and vigour. |
| 223 | 811 | Acer negundo | Manitoba Maple | 40, 43, 21 | 15 | Fair | Stems fork near ground; Moderate dieback and thinning. |
| 224 | 812 | Acer saccharinum | Silver Maple | 3 | 1 | Good | Good form and vigour. |
| 225 | 813 | Acer saccharinum | Silver Maple | 4 | 1 | Good | Good form and vigour. |
| 226 | 814 | Fraxinus pennsylvanica | Green Ash | 5, 4 | 2 | Fair-Good | Good form and vigour. |
| 227 | 815 | Acer negundo | Manitoba Maple | 4, 3 | 2 | Good | Good form and vigour. |
| 228 | 816 | Acer negundo | Manitoba Maple | 4, 4 | 2 | Good | Good form and vigour. |
| 229 | 817 | Thuja occidentalis | Eastern White Cedar | 42 | 6 | Fair | Moderate dieback; Broken lower lateral branches. |
| 230 | 818 | Acer negundo | Manitoba Maple | 23, 22, 20, 15, 10, 12 | 13 | Fair | Moderate dieback and thinning; Stems fork near ground; Growing from edge of remnant bridge. |
| 231 | 819 | Thuja occidentalis | Eastern White Cedar | 4 | 1 | Fair-Good | Some chlorosis of needles. |
| 232 | 820 | Thuja occidentalis | Eastern White Cedar | 5 | 2 | Good | Good form and vigour. |
| 233 | 821 | Thuja occidentalis | Eastern White Cedar | 3, 3 | 2 | Good | Good form and vigour. |
| 234 | 822 | Pinus strobus | White Pine | 6 | 2 | Good | Good form and vigour. |
| 235 | 823 | Thuja occidentalis | Eastern White Cedar | 5 | 2 | Good | Good form and vigour. |
| 236 | 824 | Thuja occidentalis | Eastern White Cedar | 4, 5, 3 | 2 | Good | Good form and vigour. |
| 237 | 825 | Thuja occidentalis | Eastern White Cedar | 7 | 2 | Good | Good form and vigour. |
| 238 | 826 | Malus sp. | Apple | 20, 8, 15 | 7 | Fair | Moderate dieback and thinning; Stems fork near ground. |
| 239 | 827 | Acer negundo | Manitoba Maple | 8 | 5 | Good | Good form and vigour. |
| 240 | 828 | Acer negundo | Manitoba Maple | 3 | 1 | Good | Good form and vigour. |
| 241 | 829 | Thuja occidentalis | Eastern White Cedar | 3, 2, 4, 2 | 1 | Good | Good form and vigour. |
| 242 | 830 | Thuja occidentalis | Eastern White Cedar | 4, 4 | 1 | Good | Good form and vigour. |
| 243 | 831 | Thuja occidentalis | Eastern White Cedar | 5 | 1 | Good | Good form and vigour. |
| 244 | 832 | Thuja occidentalis | Eastern White Cedar | 4 | 1 | Good | Good form and vigour. |
| 245 | 833 | Acer saccharum | Sugar Maple | 7, 3 | 2 | Fair-Good | Good form and vigour. |
| 246 | 834 | Acer saccharum | Sugar Maple | 7 | 2 | Good | Good form and vigour. |
| 247 | 835 | Acer saccharum | Sugar Maple | 80 | 12 | Fair-Good | Moderate dieback and thinning; Leader deadand snapped; Two large (~50 cm) lateral branches on east side of tree; Load entirely on both lateral branches. |
| 248 | 836 | Acer saccharum | Sugar Maple | 5 | 1 | Fair-Good | Good form and vigour. |
| 249 | 837 | Acer saccharum | Sugar Maple | 57 | 8 | Fair | Relatively small crown; Rotting cavity at approximately 2 m from ground. |
| 250 | 838 | Acer saccharum | Sugar Maple | 80 | 12 | Fair-Good | Relatively small crown; Minor dieback and thinning. |
| 251 | 839 | Acer saccharum | Sugar Maple | 10 | 3 | Good | Good form and vigour. |
| 252 | 840 | Tilia americana | Basswood | 60 | 7 | Fair-Good | Minor dieback and thinning; Tree leaning towards the east. |
| 253 | 841 | Tilia americana | Basswood | 10 | 4 | Fair-Good | Minor dieback and thinning; Tree leaning towards the east. |
| 254 | 842 | Thuja occidentalis | Eastern White Cedar | 24 | 4 | Fair | Moderate dieback and thinning; One of two stems dead; Stems fork ~ 2.5 m from ground. |
| 255 | 843 | Acer saccharum | Sugar Maple | 46 | 7 | Good | Good form and vigour; Relatively small crown. |
| 256 | 844 | Acer saccharum | Sugar Maple | 25 | 4 | Poor-Fair | Tree declining in health likely due to overcrowding; Leaning slightly towards the north; Uneven crown with load on north side of tree. |
| 257 | 845 | Thuja occidentalis | Eastern White Cedar | 26, 33, 39, 24, 21 | 8 | Fair-Good | Stems fork near ground; Minor dieback and thinning. |
| 258 | 846 | Thuja occidentalis | Eastern White Cedar | 17, 25, 28 | 4 | Fair | Moderate dieback and thinning; Stems fork near ground. |
| 259 | 847 | Acer saccharum | Sugar Maple | 42 | 9 | Fair-Good | Minor dieback and thinning. |
| 260 | 848 | Acer saccharum | Sugar Maple | 60 | 4 | Fair | Relatively small crown; Stems fork just above breast height. |
| 261 | 849 | Acer negundo | Manitoba Maple | 25, 10, 18, 26, 12 | 12 | Fair | Moderate dieback and thinning; Stems fork near ground; Under utility lines. |
| 262 | 850 | Thuja occidentalis | Eastern White Cedar | 29 | 6 | Fair | Moderate dieback and thinning; Significant lean towards the south. |
| 263 | 851 | Acer saccharum | Sugar Maple | 21 | 7 | Good | Good form and vigour. |
| 264 | 852 | Fraxinus americana | American Elm | 17 | 4 | Fair-Good | Minor dieback; Smothered by grapevines. |
| 265 | 853 | Juglans nigra | Black Walnut | 27 | 7 | Good | Good form and vigour. |
| 266 | 854 | Juglans nigra | Black Walnut | 36 | 8 | Good | Good form and vigour. |
| 267 | 855 | Thuja occidentalis | Eastern White Cedar | 34 | 6 | Fair | Moderate dieback and thinning; Rotting vertical cavity along trunk. |
| 268 | 856 | Salix x sepulcralis | Weeping Willow | 76 | 14 | Fair-Good | Moderate dieback and thinning; Two stems with one of the stems dead. |
| 269 | 857 | Pinus nigra | Austrian Pine | 18 | 6 | Fair-Good | Good vigour; Corrected lean. |
| 270 | 858 | Pinus nigra | Austrian Pine | 36 | 7 | Fair-Good | Minor dieback and thinning. |
| 271 | 859 | Pinus nigra | Austrian Pine | 29 | 7 | Poor | Significant decline with less than half of crown remaining. |
| 272 | 860 | Pinus nigra | Austrian Pine | 29 | 6 | Poor-Fair | Tree declining in health; Lion-tailing; Inner branches dead. |
| 273 | 861 | Pinus nigra | Austrian Pine | 40 | 7 | Fair-Good | Moderate dieback and thinning; Leader snapped. |
| 274 | 862 | Pinus nigra | Austrian Pine | 33 | 7 | Fair-Good | Minor dieback and dead lower lateral branches. |
| 275 | 863 | Fraxinus pennsylvanica | Green Ash | 28 | NA | Dead | Dead as a result of infestation from EAB. |
| 276 | 864 | Pinus nigra | Austrian Pine | 30 | 7 | Fair | Moderate dieback and thinning. |
| 277 | 865 | Pinus nigra | Austrian Pine | 35 | 7 | Fair-Good | Minor dieback and thinning; Leader snapped. |
| 278 | 866 | Pinus nigra | Austrian Pine | 30 | 7 | Good | Good form and vigour. |
| 279 | 867 | Pinus nigra | Austrian Pine | 35 | 7 | Fair-Good | Corrected lean; Minor dieback and thinning. |
| 280 | 868 | Pinus nigra | Austrian Pine | 13 | 3 | Fair-Good | Relatively small crown; Corrected lean. |
| 281 | 869 | Pinus nigra | Austrian Pine | 31 | 7 | Fair-Good | Minor dieback; Leader snapped. |
| 282 | 870 | Pinus nigra | Austrian Pine | 41 | 8 | Fair-Good | Leader cut; Minor dieback and thinning. |
| 283 | 871 | Pinus nigra | Austrian Pine | 38 | 7 | Fair | Moderate dieback and thinning; Stems cut at top of crown. |
| 284 | 872 | Acer saccharum | Sugar Maple | 3 | 1 | Good | Good form and vigour. |
| 285 | 873 | Populus tremuloides | Trembling Aspen | 8 | 2 | Good | Good form and vigour. |
| 286 | 874 | Fraxinus pennsylvanica | Green Ash | 29 | NA | Dead | Dead as a result of infestation from EAB. |
| 287 | 875 | Populus tremuloides | Trembling Aspen | 20 | 4 | Good | Good form and vigour. |
| 288 | 876 | Populus tremuloides | Trembling Aspen | 3 | 1 | Good | Good form and vigour. |
| 289 | 877 | Fraxinus pennsylvanica | Green Ash | 6 | 1 | Fair-Good | Good vigour; Not yet affected by EAB. |
| 290 | 878 | Fraxinus pennsylvanica | Green Ash | 5 | 2 | Fair-Good | Good vigour; Not yet affected by EAB. |
| 291 | 879 | Fraxinus pennsylvanica | Green Ash | 7 | 1 | Fair | Very small crown at very top of tree; Crack in stem. |
| 292 | 880 | Populus tremuloides | Trembling Aspen | 8 | 1 | Fair | Tree smothered entirely by grapevines. |
| 293 | 881 | Fraxinus pennsylvanica | Green Ash | 5 | 1 | Good | Good form and vigour. |
| 294 | 882 | Juglans nigra |

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# 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<br>Item | Column 2<br>Tree stem diameter | Column 3<br>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 Kennedy Road EA Studies – Warden Avenue
Figure 2 – Warden Avenue and Kennedy Road EA Studies – Kennedy Road

**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 |

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Grid North

0 100 200 300 400 500 600
Metres

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

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| | |
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Map Title
# WARDEN AVE AND KENNEDY RD EA STUDIES
KENNEDY RD

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