# Appendix C

## Natural Heritage Assessment

# Guelph Line (Regional Road 1) Improvements

PR. 2829A

## Natural Heritage Report

*November 2012*

DOUGAN & ASSOCIATES
ECOLOGICAL CONSULTING & DESIGN

77 Wyndham Street South • Guelph ON N1E 5R3
T 519.822.1609 • F 519.822.5389 • www.dougan.ca

## PREPARED FOR:

The Regional Municipality of Halton

## PREPARED BY:

Dougan & Associates
Ecological Consulting & Design
77 Wyndham Street South
Guelph Ontario N1E 5R3

**Primary Author:** Mary Anne Young, Dougan & Associates
**Reviewed By:** IBI Group

## STUDY TEAM

**IBI Group** *(Lead consultant)*
30 International Boulevard
Toronto ON M9W 5P3 Canada

# TABLE OF CONTENTS



## LIST OF APPENDICES



## LIST OF MAPS

# 1. INTRODUCTION

Dougan & Associates (D&A) has been retained by the IBI Group to provide terrestrial ecology and arboricultural expertise for the Environmental Assessment of Guelph Line (Regional Road 1) south of the QEW in Burlington. The scope of D&A's work includes vegetation community classification, compilation of a comprehensive vascular plants species list for the site, and an arborist assessment for areas within the estimated limits of disturbance.

The study area for this project was defined by the IBI Group to be the QEW to the north, just south of McDowell Road to the south, South Service Road/Laurentian Drive to the east and Queensway Drive/Glenwood School Drive to the west (see Figure 1). The rapid vegetation characterization was carried out for these areas in their entirety, and the tree assessment was undertaken within10m of the road right-of-way.

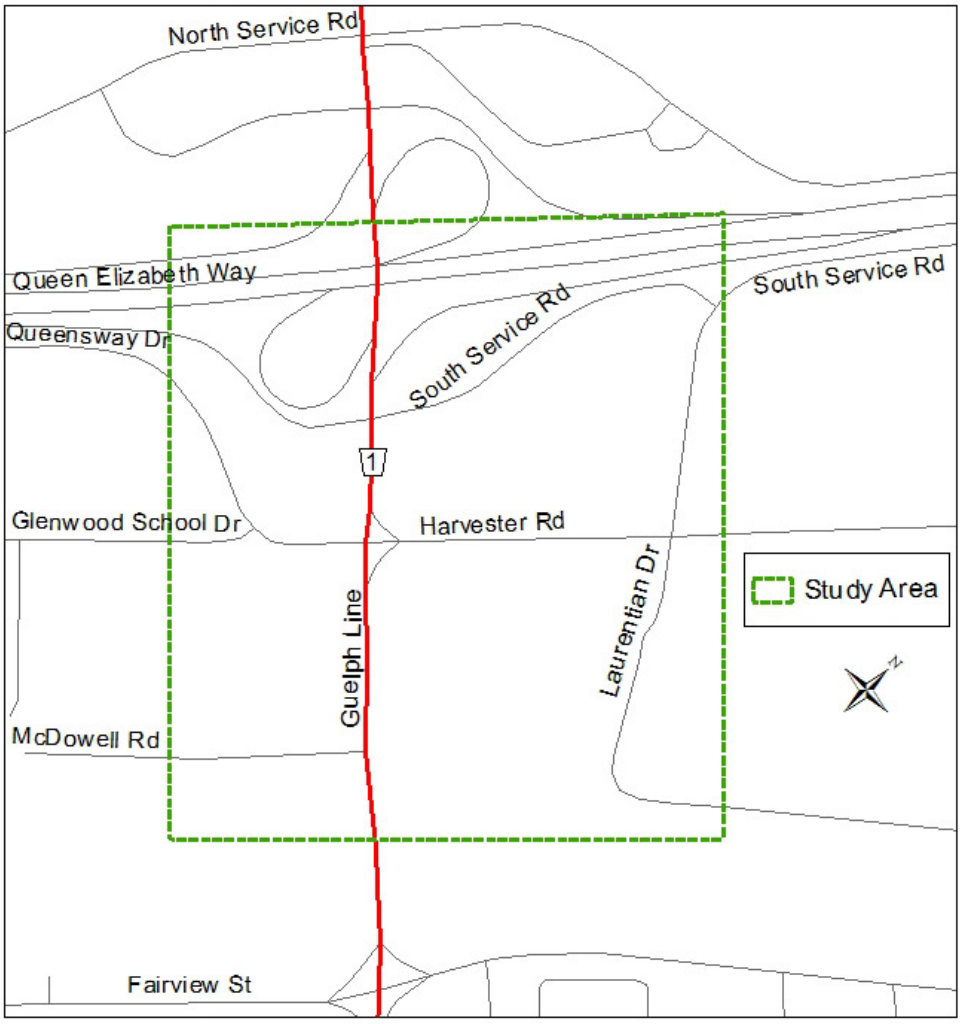



**Figure 1: Study Area Boundary**

# 2. METHODS

The ecological investigations for this project included a review of relevant background information, including policy documents, a vegetation community survey, and an arborist assessment. No wildlife surveys were part of the scope of work for this project.

## 2.1. BACKGROUND DOCUMENT REVIEW

Prior to the field investigation D&A staff conducted a background review to identify potential natural heritage policy designations, natural heritage features, and significant species within the study area. The background document review included an analysis of the following policy documents:

**Provincial**

- Provincial Policy Statement;
- Greenbelt Plan; and
- Ministry of Natural Resources' Natural Heritage Information Centre (NHIC) database.

**Regional**

- Regional Municipality of Halton's Regional Official Plan;
- Regional Municipality of Halton's Environmentally Sensitive Areas report; and
- Conservation Halton's Regulatory Floodplain.

**Local**

- City of Burlington's Official Plan.

## 2.2. VEGETATION COMMUNITY SURVEY

A botanical field survey of the study area was conducted on October 17, 2012 by D&A staff. Documentation of existing vegetative cover included assignment of vegetation communities according to the Ecological Land Classification System for Southern Ontario at the Vegetation Type level (Lee et al. 1998). ELC polygons were assigned using current digital aerial photography and then confirmed on site using the Community Description and Soils Data Cards. The vascular plant species were identified using the standards stipulated in the Ontario Plant List (Newmaster, 1998). Plants that the field staff were not able to identify on site, such as immature plants or difficult genera, were collected and subsequently identified in the D&A office.

No wildlife data was collected as part of this study process.

## 2.3. ARBORIST ASSESMENT

Tagging and assessment of trees potentially impacted in the study area was also carried out on October 17, 2012. The trees assessed were those greater than 10cm diameter at breast height (DBH) within approximately 10 meters of the roads within the study area. Each tree was tagged with a sequentially numbered metal tree tag and data regarding species, size, health, structural condition, and preservation priority was collected; the location of each tree was picked up using D&A's high-accuracy Trimble GPS device.

# 3. FINDINGS

## 3.1. BACKGROUND DOCUMENT REVIEW

This review included an analysis of Provincial, Regional, and Local policy documents and a query of the Ministry of Natural Resources' Natural NHIC database.

### 3.1.1. PLANNING & POLICY DESIGNATIONS

The review of Provincial, Regional, and Local policy documents found that the study site's natural heritage designations are primarily due to the proximity of Roseland Creek.

**Provincial**

*Provincial Policy Statement*
Section 2 the Provincial Policy Statement, dealing with the protection of natural heritage, is relevant to this study area. Section 2 states generally that natural heritage features shall be protected for the long term and specifically that development and site alteration shall not be permitted in:

- Significant habitat of endangered and threatened species;
- Significant wetlands;
- Significant coastal wetlands;
- Significant wetlands in the Canadian Shield north of Ecoregions 5E, 6E and 7E1;
- Significant woodlands south and east of the Canadian Shield;
- Significant valleylands south and east of the Canadian Shield;
- Significant wildlife habitat;
- Significant areas of natural and scientific interest;
- Fish habitat; and
- Lands adjacent to lands containing any of these significant features.

The study area does not contain any significant wetlands, coastal wetlands, woodlands, valleylands, or Areas of Natural and Scientific Interest, but is adjacent to one candidate significant woodland (see Map 1 for location). It does contain Roseland Creek, which is a watercourse but is unlikely to be fish habitat because it has been routed underground both to the north and south of the study area. Conservation Halton should have data regarding the status of this watercourse as fish habitat; if Roseland Creek is indeed fish habitat the existing features and functions of the Creek should be protected and preserved.

*The Greenbelt Plan*
The study area is outside of the Greenbelt Plan policy area, thus the policies of the Greenbelt Plan do not apply. The study site does not contain nor is adjacent to any Areas of Natural and Scientific Interest (ANSI). See Section 3.1.2 for a summary of the NHIC database query.

**Regional**

*Regional Official Plan*
One candidate significant woodland has been identified by the Regional Municipality of Halton in the vicinity of study site. It is policy of the Region to "132(2) Consider all *Woodlands* 0.5 ha or larger to be an important natural *heritage feature* and candidates for assessment as *Significant Woodlands"*. The following criteria are used to assess Significant Woodlands:

*277. SIGNIFICANT WOODLAND means a Woodland 0.5ha or larger determined through a Watershed Management Plan, a Subwatershed Study or a site-specific Environmental Impact Assessment to meet one or more of the four following criteria:**

*(1) the Woodland contains forest patches over 99 years old,**

*(2) the patch size of the Woodland is 2 ha or larger if it is located in the Urban Area, or 4 ha or larger if it is located outside the Urban Area but below the Escarpment Brow, or 10 ha or larger if it is located outside the Urban Area but above the Escarpment Brow,**

*(3) the Woodland has an interior core area of 4 ha or larger, measured 100m from the edge, or**

*(4) the Woodland is wholly or partially within 50m of a major creek or certain headwater creek or within 150m of the Escarpment Brow. **

* these definitions have been amended from their original wording by the following Regional Official Plan Amendments: Amd25-D4, Amd25-D5, Amd25-D6, Amd25-D7

The woodland adjacent to the study site is located beside a Leon's Furniture store north of the QEW and east of Guelph Line, and fits criteria 4 as it is within 50m of the headwaters of Roseland Creek. This woodland is not within the estimated limits of disturbance for this project and thus no impacts are anticipated to its features or functions.

Map 1, Regional Structure, of the Regional Municipality of Halton's Regional Official Plan shows part of the study area designated as Greenlands A within the Regional Greenlands system.

Greenlands A "includes only land and water areas that meet one or more of the following criteria":

*126(a) Areas included in the Regulatory Flood Plains, as determined and mapped by the appropriate Conservation Authority, and refined from time to time;*

*b) Lake Ontario and Burlington Bay shoreline outside Regional Waterfront Parks;*

*c) Provincially Significant Wetlands, as determined by the Ministry of Natural Resources, and refined from time to time; and*

*d) Significant portions of the habitat of endangered and threatened species, as determined by the Ministry of Natural Resources, and refined from time to time.*

The part of the study site designated as Greenlands A fits into criteria 126(a), as it is the regulatory floodplain of Roseland Creek. See the following discussion regarding Conservation Halton policies for further information about the regulatory floodplain.

*Environmentally Sensitive Areas Report*

According to the Regional Municipality of Halton's Environmentally Sensitive Areas report, the study site is not designated as or adjacent to an Environmentally Sensitive Area (ESA), nor are any identified or evaluated wetlands in the in vicinity of study site.

*Conservation Halton*

Conservation Halton has developed a series of land use planning policies to guide their plan input and review. The applicable policies for the Bronte Creek corridor in the vicinity of the study site are those that pertain to valleylands and woodlands and those which apply to the regulatory floodplain. Policy, 4.6.4, Significant Woodlands, states:

> *Policies 2.1.4 (b) and 2.1.6 of the Provincial Policy Statement state that development and site alteration shall not be permitted within or adjacent to significant woodlands south and east of the Canadian Shield unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions. The Ministry of Natural Resources Natural Heritage Reference Manual (1999) provides parameters for identifying significant woodlands and considers adjacent lands to be within 50 metres. As such, an Environmental Impact Study will be required for planning applications within or*

*adjacent to significant woodlands. In keeping with the Provincial Policy Statement, staff will work with watershed municipalities to ensure significant woodlands are identified in Official Plans and zoning by-laws and designated in appropriate Greenlands and Conservation Management zones. In the absence of an up-to-date subwatershed study (approved by Conservation Halton), a minimum 10 metre development and site alteration setback from dripline, to be confirmed through an Environmental Impact Study, will be recommended outside of the Greenbelt Plan Area and the Niagara Escarpment Plan Area."*

As the anticipated limits of development are more than 50m from the identified Candidate Significant Woodland, this policy does not apply.

Conservation Halton regulates all work taking place which may affect watercourses, wetlands, and the regulated floodplain of these features. Approximately half of the study area east of Guelph Line is within the regulated floodplain of Roseland Creek (see Figure 2), however the creek itself is underground from north of the QEW to south of Harvester Road. Policy 3.1 of the document "Policies, Procedures, and Guidelines for the Administration of Ontario Regulation 162/06 and Land Use Planning Policy Document" (2006) states:

*Except where allowed under Policies 3.4 – 3.53 (inclusive), development is prohibited within a watercourse, valleyland, hazardous lands, wetland and lands adjacent or close to the shoreline of the Great Lakes – St. Lawrence River System or to inland lakes that may be affected by flooding, erosion or dynamic beaches.*

Policy 3.4 states that Roseland Creek is considered to be a "minor valley system" and thus requires a 7.5m minimum allowance adjacent to the stable top of bank. To D&A's knowledge the stable top of bank has not been determined for Roseland Creek within the study area, however where the creek is above ground the creek has been channelized, which may make the banks more stable than they would naturally have been. The IBI Group is working on the engineering aspects of this project; see their Stormwater Management Existing Conditions Report for an in-depth analysis and explanation of the implications of the regulatory floodplain within the study area.

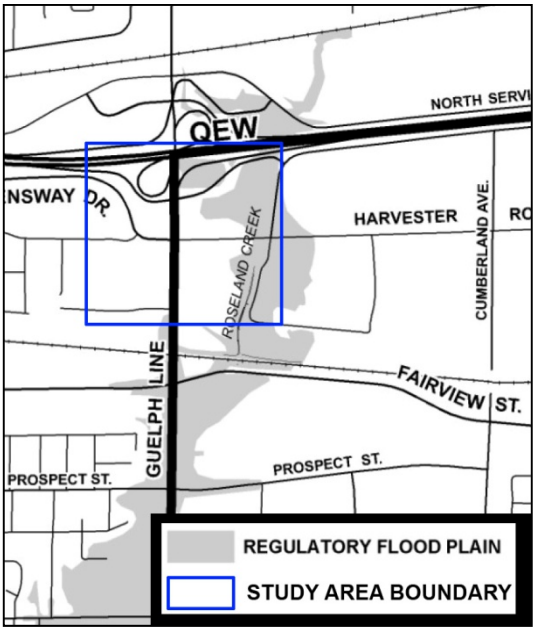



**Figure 2: Regulatory Flood Plain**
**(from Burlington Official Plan, Part 6)**

**Local**

The City of Burlington's Official Plan (last updated June 2012) identifies a Natural Heritage System (NHS) within the City's boundaries. This system was designed to conform with and be complementary to Halton Region's Greenlands system, the Niagara Escarpment Plan, and the Greenbelt Plan. However, Policy 2.4.1(b) states that "*The identification of a Natural Heritage System and appropriate policies and mapping related to it shall be incorporated into this Plan by separate amendment*." This amendment is not yet available, however given that part of the study area is identified as part of the Regional Greenlands System it is likely that they will be part of the City's Natural Heritage System and that the policies in place for the NHS will apply.

### 3.1.2. NATURAL HERITAGE INFORMATION CENTRE QUERY

A query was made of the NHIC database to determine whether significant species have been reported for the study site or the site's vicinity. Sixteen significant species occurrences have been reported for the study site and its vicinity; Table 1 shows these species and their rarity designations.

**Table 1: Significant Species Identified in NHIC Query**

| Scientific Name | English Name | G-rank | S-rank | Federal (COSEWIC) Status | Provincial (SARO) Status | First Observed Date | Last Observed Date |
|---|---|---|---|---|---|---|---|
| **Flora** | | | | | | | |
| *Aplectrum hyemale* | Puttyroot | G5 | S2 | | | 1889 | 1889-04-19 |
| *Aureolaria virginica* | Downy Yellow False Foxglove | G5 | S1 | | | 7/26/1957 | 7/26/1957 |
| *Crataegus brainerdii* | Brainerd's Hawthorn | G5 | S2 | | | 1981 | 9/7/1981 |
| *Crataegus dissona* | Northern Hawthorn | G4G5 | S3 | | | 1981 | 9/5/1981 |
| *Euonymus atropurpureus* | Burning Bush | G5 | S3 | | | 6/30/1973 | 6/30/1973 |
| *Hypoxis hirsuta* | Yellow Stargrass | G5 | S3 | | | | 1898-06-10 |
| *Mertensia virginica* | Virginia Lungwort | G5 | S3 | | | 5/5/1938 | 5/26/1982 |
| *Porteranthus trifoliatus* | Bowman's-root | G4G5 | SX | | | | |
| *Sphenopholis nitida* | Shiny Wedge Grass | G5 | S1 | | | 1988 | 1988 |
| *Uvularia perfoliata* | Perfoliate Bellwort | G5 | S1 | | | 6/4/1964 | 5/11/2001 |
| **Fauna** | | | | | | | |
| *Cordulegaster obliqua* | Arrowhead Spiketail | G4 | S2 | | | 1931 | 1931 |
| *Coregonus hoyi* | Bloater | G4 | S4 | NAR | NAR | 1919 | 1919 |
| *Coregonus reighardi* | Shortnose Cisco | GH | SH | END | END | 11/8/1915 | 11/8/1915 |
| *Crotalus horridus* | Timber Rattlesnake | G4 | SX | EXP | EXP | 1669-09 | 1950 |
| *Nycticorax nycticorax* | Black-crowned Night-heron | G5 | S3B,S3N | | | 1936 | 1936 |
| *Pipistrellus subflavus* | Eastern Pipistrelle | G5 | S3? | | | 2/23/1941 | 2/28/1942 |

The full NHIC query data is presented in Appendix 5, NHIC Query, for reference.

***Flora Result Analysis***

Of the plant species identified in the NHIC query, appropriate habitat is present on the study site for only two, Brainerd's Hawthorn and Northern Hawthorn, which are found in "old fields, poorly managed pastures, fencelines and roadsides" (MNR 2000). Appropriate habitat is not present for the remaining eight plant species identified in the NHIC query:

- Puttyroot, Burning Bush, Virginia Lungwort, Shiny Wedge Grass, and Perfoliate Bellwort all require rich to moist deciduous woods; and

- Downy Yellow False Foxglove, Yellow Stargrass, and Bowman's-root all require prairie, savannah, or dry deciduous woods. ((MNR 2000)

The deciduous woodland species may possibly be present in the Candidate Significant Woodland north of the QEW and east of Guelph Line; this feature is outside of the study area boundary (see Map 1). The open cultural areas may provide some habitat for the prairie-affiliated species, but their presence here is unlikely; the most recent "last observed date" for these species is 1957, and significant road expansion and other development has occurred in this area since that time, greatly changing the edaphic conditions and species composition of the study site.

***Fauna Result Analysis***

Of the wildlife species identified, one (Timber Rattlesnake) is extirpated from Ontario and no appropriate habitat is present for the remaining five (Arrowhead Spiketail, Bloater, Shortnose Cisco, Black-crowned Night-heron, and Eastern Pipistrelle):

- Arrowhead Spiketail's habitat is "Small spring fed streams and seeps with soft bottoms and sometimes rocks. These streams are usually in forested areas, seepage areas may be in wet meadows." This habitat is not present on or adjacent to the study site;
- Bloater and Shortnose Cisco are both fish of the Great Lakes, their presence this far upstream is unlikely given the urban development downstream on Roseland Creek which has occurred since these species were observed in 1919 and 1915, respectively;
- Black-crowned Night-herons' habitat is "fresh and salt-water marshes, swamps, lakes and wooded streams." This habitat is not present on or adjacent to the study site;
- Eastern Pipistrelle requires caves or mines for hibernation and feeds by hunting insects at the edges of forests, near streams or over open water; its use of this site for hunting is unlikely due to the presence of the QEW, a major traffic corridor. (MNR 2000)

## 3.2. VEGETATION COMMUNITY SURVEY

The field survey recorded a total of 7 community polygons representing 3 ELC vegetation community types within the 30.7 ha area surveyed. The vegetation communities found are described in Section 3.2.1 and are mapped on Map 1: ELC Vegetation Communities. A total of 62 species were found, 28 (46 %) of which are native to Ontario and 33 (54 %) are introduced. One additional plant was identified to genus level only due to being observed and/or collected at a stage of maturity in which it was not possible to identify them to species level.

No species of federal or provincial significance were identified; however, two Regionally uncommon and one Regionally rare species were observed. The list of vascular plant species and their respective rankings is included in this report as Appendix 2, Vascular Plant Species and Status List.

### 3.2.1. VEGETATION COMMUNITY DESCRIPTIONS

The following vegetation community descriptions provide a general characterization of the flora and physiography within each mapped unit. For a more comprehensive list of species found refer to Appendix 2, Vascular Plant Species and Status List.

The respective areas of the vegetation communities and land use in the study area are descriptive of the type of habitat features and functions present (see Table 2).

Over half of the total area is either Anthropogenic lands, comprised of buildings, driveways, parking lots, and manicured grounds, or roadways. The remaining lands were found to all be Cultural communities, which means that they have been created and/or maintained by the influence of humans. Cultural communities are generally characterized by a large proportion of non-native species, an abundance of non-native species, and low to moderate (up to 60%) canopy cover.

| Community Type | Area (ha) |
|---|---|
| Cultural Meadow | 3.9 |
| Cultural Thicket | 1.1 |
| Cultural Woodland | 0.1 |
| Roads | 7.9 |
| Anthropogenic | 13.6 |
| No data | 4.1 |
| **Total** | **30.7** |

**Table 2: Vegetation Communities & Land Use**

### 1. CUT, Cultural Thicket (Roseland Creek corridor)

Thirty-eight species were found in this community, which is 0.4 ha in size, but extends farther south from the area surveyed. The corridor begins approximately 50m south of Harvester Road adjacent to Laurentian Drive. The creek begins north of the QEW and daylights in this channel, is routed underground again from the rail line approximately 150m south of the study area until south of Burlington Mall. The channel has been straightened and has hardened banks, which are showing signs of erosion.

The vegetation composition in this community is variable, with some open areas and some treed; all species observed are those typical to disturbed successional environments. Overall the tree canopy cover is <25% and shrub cover is >25%, where shrubs are defined as woody vegetation <10 cm DBH and <5m tall. The tree species present include Manitoba Maple (*Acer negundo), Siberian* Elm (Ulmus pumila), Russian Olive (*Elaeagnus angustifolia*), Black Walnut (*Juglans nigra*), and non-native tree Willows (*Salix fragilis* and *Salix alba*). Shrub cover includes young saplings of the species mentioned above as well as Black Raspberry (*Rubus occidentalis*), Sand Willow (*Salix exigua*), Tartarian Honeysuckle (*Lonicera tartarica*), and others. The herbaceous species observed included Orchard Grass (*Dactylis glomerata*), Dandelion (*Taraxacum officinale*), Common Milkweed (*Asclepias syriaca*), and Garlic Mustard (*Alliaria petiolaris*).

Two Regionally significant species were found in this community; Virginia Creeper (*Parthenocissus quinquefolia*), which is considered Rare in both the GTA and the Regional Municipality of Halton, and Sandbar Willow (*Salix exigua*), which is considered Uncommon in the Regional Municipality of Halton. A listing of Rare in the GTA means that the species is known to occur at 40 or fewer stations and a listing of Rare in Halton means that the species is known to occur at 5 or fewer stations. It is possible that the plants found were Thicket Creeper (*Parthenocissus quinquefolia var. quinquefolia*) which is not rare, as the field survey was conducted late in the season. A listing of Uncommon in Halton means that the species is known to occur at 6 to 15 stations.

Photo 1: Polygon 1

### 2. CUW, Cultural Woodland (outside of study area boundary)

Photo 2: Polygon 2, from edge

Seventeen species were found in this community, which is 2.7 ha in size. This community is outside of the study area boundary but was surveyed regardless because it was the largest area of semi-natural cover in the vicinity of the study area.

This community has a canopy cover of >40%, consisting predominantly of Manitoba Maple (*Acer negundo*). Understory species include Red-osier Dogwood (*Cornus sericea*), Common Buckthorn (*Rhamnus cathartica*), Riverbank Grape (*Vitis riparia*), and Garlic Mustard (*Alliaria petiolata*), with Staghorn Sumac (*Rhus typhina*), Teasel (*Dipsacus fullonum*), Canada Goldenrod (*Solidago canadensis*), and Asters (*Symphiotrichum novae-anglea* and *S. lanceolata*) present at edges. The species composition is largely non-native, with little variability in habitat form and function.

No Regionally or Locally significant species were observed in this community.

### 3. CUT, Cultural Thicket (south of South Service Road)

Twenty-one species were found in this community, which is 0.7 ha in size. It is located between South Service Road and the backs of commercial properties which front onto Laurentian Drive and Harvester Road.

Most of this community is open with scattered trees and approximately 30% shrub cover. Tree species observed include Siberian Elm (*Ulmus pumila*) , Russian Olive (*Elaeagnus angustifolia*), Common Apple (*Malus pumila*), and Cottonwood (*Populus deltoides*). This community's designation as a Thicket is largely because many small Siberian Elm (*Ulmus pumila*) were which were between 5-10 cm DBH and 3 – 5 m tall, forming a near monoculture along the east side of South Service Road. Shrub species observed were limited to Chokecherry (*Prunus virginiana*) and Eastern Red Cedar (*Juniperus virginiana*) while the ground layer included Asters (*Symphyiotrichum lanceolata* and *S. novae-anglea*), Viper's Bug-

Photo 3: Polygon 3, open canopy area

Photo 4: Polygon 3, Siberian Elm thicket

loss (*Echium vulgare*), Canada Goldenrod (*Solidago canadensis*), and Smooth Brome (*Bromus inermis*), among others.

The species composition is largely non-native, with little variability in habitat form and function.

No Regionally or Locally significant species were observed in this community.

**4. CUM, Cultural Meadow (between South Service Road & QEW)**

Seventeen species were found in this community, which is 1.1 ha in size. 1 plant was identified to genus level only due to being observed and/or collected at a stage of maturity in which it was not possible to identify them to species level. This polygon is located between South Service Road and the onramp to the eastbound QEW.

This community is predominantly open, with scattered trees forming a canopy of less than 10%. Most of the trees present are <10cm DBH except for two very large (90cm and 110cm DBH) Siberian Elms (*Ulmus pumila*). These trees are both in good health and condition and although they are non-native are high priority for preservation due to their large size. Other trees observed include Russian Olive (*Elaeagnus angustifolia*), Honeylocust (*Gleditsia tricanthos*), and White Spruce (*Picea glauca*). Shrub cover is <15% and consists of scattered Staghorn Sumac (*Rhus typhina*), and some Riverbank Grape (*Vitis riparia*). Herbaceous cover is high, <90% with very little bare ground, with x, x, and x dominating at the time of the field visit. Recent plantings along the north side of South Service Road account for much of the tree and shrub diversity in this polygon.

One Regionally significant species, White Spruce (*Picea glauca*) was found in this community; this species is considered to be Uncommon in Halton with 6 to 15 known occurrences. However, all White Spruce observed had obviously been recently planted along with a number of other trees along the north side of South Service Road.

Photo 5: Polygon 4, trees in background at left are on south side of South Service Road

Photo 6: Polygon 5

### 5. CUM, Cultural Meadow (west of Guelph Line, south of Queensway Drive)

Twenty-one species were found in this community, which is 1.2 ha in size. This community is located west of Guelph Line and south of Queensway Drive. Based on airphoto interpretation and degraded concrete pads found on the site, it appears that this polygon was once Anthropogenic in nature, and now in its unmaintained state is slowly naturalizing.

The tree cover in this community is <10%, consisting of ornamental species which seemed to be remnants of the former use of this property. These include English Oak (*Quercus rubra*), Colorado Blue Spruce (*Picea pungens*), Norway Maple (*Acer platanoides*), as well as opportunistic species such as Siberian Elm (*Ulmus pumila*) and x. Shrub cover was low, <10%, and species were limited to Burning Bush (*Euonymus alatus*) and Tartarian Honeysuckle (*Lonicera tartarica*). Herbaceous cover is >90%, including Smooth Brome (*Bromus inermis*), Bull Thistle (*Cirsium vulgare*), Heath Aster (*Aster ericoid*es) and Common Milkweed (*Asclepias syriaca*) at the time of the field survey.

No Regionally or Locally significant species were observed in this community.

### 6. CUM, Cultural Meadow (west of Guelph Line, north of Queensway Drive)

Fifteen species were found in this community, which is 1.1 ha in size and is located west of Guelph Line and between Queensway Drive and the off ramp from the eastbound QEW. A portion of this area is taken up by a private property; tree cover was higher in this property than in the remainder of the site.

This community is predominantly open, with scattered trees and shrubs and high cover of herbaceous species. Four large trees, two Black Walnut (*Juglans nigra*) and two Black Locust (*Robinia pseudoacacia*) 45 – 80cm DBH are located close to the Guelph Line / Queensway Drive interchange, otherwise the trees present, excluding those on the private property, are <10cm DBH. Shrub cover is <10% and consists of x , x and x. Herbaceous cover is high, >90%, consisting of Burning Bush (*Euonymus alatus*), Staghorn Sumac (*Rhus typhina*), and Tartarian Honeysuckle (*Lonicera tartarica*). The lowest area of this community, a ditch, contains wet-tolerant species including Narrowleaf Cattail (*Typha angustifolia*) and Purple Loosestrife (*Lythrum salicaria*), however the majority of the polygon is dryer, with Canada Goldenrod (*Solidago canadensis*), Smooth Brome (*Bromus inermis*), New England Aster (*Symphyiotrichum novae-anglea*), and Catnip (*Nepeta cataria*) in the herbaceous layer.

No Regionally or Locally significant species were observed in this community.

Photo 7: Polygon 6 looking south, Guelph Line at left

Photo 8: Polygon 6 looking north

### 7. CUM & CUW, Cultural Meadow & Cultural Woodland (cloverleaf west of Guelph Line, north of eastbound off ramp)

Twenty-three species were found in this community, which is 0.6 ha in size. Of this, 0.1 ha is Cultural Woodland and 0.5 ha is Cultural Meadow. It is located west of Guelph Line and between the QEW and the eastbound off ramp.

The Cultural Meadow portion of this community has tree and shrub cover <10% and herbaceous cover >80%; dominant species include Canada Goldenrod (*Solidago canadensis*), Smooth Brome (*Bromus inermis*), Common Milkweed (*Asclepias syriaca*), and New England Aster (*Sympyiotrichum novae-anglea*). Some trees and shrubs have recently been installed on the north side of the off ramp. The Cultural Woodland portion of this community is located in the centre of the community, >10m from any edge, and has approximately 60% tree cover, and 25-40% shrub and herbaceous cover. The tree species include Austrian Pine (*Pinus nigra*), Scots Pine (*Pinus sylvestris*), Oak (*Quercus* sp), and White Elm (*Ulmus americana*). Shrub and herbaceous species are very similar to those present in the Cultural Meadow community, just less abundant.

One Regionally significant species was found in this community; Virginia Creeper (*Parthenocissus quinquefolia*), which is considered Rare in both the GTA and the Regional Municipality of Halton. As with the Virginia Creeper plants observed in Community 1, it is possible that the plants found were Thicket Creeper (*Parthenocissus quinquefolia var. quinquefolia*), a common species.

Photo 9: Polygon 7, showing CUM and CUW

Photo 10: Polygon 7, showing CUW and gravel access turnaround

### 3.2.2. ARBORIST SURVEY

A total of 101 trees were identified and tagged during the field investigation. A total of 22 species of tree were tagged and evaluated; these species and their relative abundance are shown in Table 3. The most abundant species was Siberian Elm (*Ulmus pumila*), with 16 found, followed closely by Austrian Pine (*Pinus nigra*), with 15 found. Of the trees tagged, 9 species are native to Halton Region and 13 are non-native, for a total of 29 native and 72 non-native individual trees.

The majority of the trees (51) are between 25 – 45 cm DBH, with 34 trees between 10 – 20 cm DBH and 13 trees 50 cm DBH or greater. Of these trees, 4 are greater than 100 cm DBH. The largest tree tagged was a 120 cm DBH Siberian Elm (*Ulmus pumila*) in the cloverleaf east of Guelph Line and south of the QEW.

The majority of trees assessed in the study area are of medium health, structure, and preservation priority. In total, 10 trees were defined as "High" preservation priority based on size, species, structure, and health. Efforts should be made to protect and preserve the high preservation priority trees that were found on the study site, including tree protection fencing to be installed 1.0m outside the trees' driplines and left in place throughout the construction process.

The locations of the trees found and their preservation priority are shown on Maps 2a and 2b, Tree Assessment.

**Table 3: Tagged Tree Data Summary**

| Current Common Name | Current Botanic Name | Count | Native Species? |
|---|---|---|---|
| Manitoba Maple | *Acer negundo* | 4 | N |
| Norway Maple | *Acer platanoides* | 13 | N |
| Silver Maple | *Acer saccharinum* | 1 | Y |
| Sugar Maple | *Acer saccharum* | 1 | Y |
| Freeman's Maple | *Acer x freemanii* | 1 | Y |
| Shagbark Hickory | *Carya ovata* | 1 | Y |
| Russian Olive | *Elaeagnus angustifolia* | 4 | N |
| White Ash | *Fraxinus americana* | 12 | Y |
| Black Walnut | *Juglans nigra* | 8 | Y |
| White Mulberry | *Morus alba* | 1 | N |
| Colorado Spruce | *Picea pungens* | 2 | N |
| Austrian Pine | *Pinus nigra* | 15 | N |
| London Plane Tree | *Platanus x acerifolia* | 1 | N |
| Cottonwood | *Populus deltoides* | 3 | Y |
| Largetooth Aspen | *Populus grandidentata* | 1 | Y |
| English Oak | *Quercus robur* | 1 | N |
| Black Locust | *Robinia pseudoacacia* | 8 | N |
| White Willow | *Salix alba* | 4 | N |
| Crack Willow | *Salix fragilis* | 2 | N |
| Littleleaf Linden | *Tilia cordata* | 1 | N |
| American Elm | *Ulmus americana* | 1 | Y |
| Siberian Elm | *Ulmus pumila* | 16 | N |

# 4. CONSTRAINT ANALYSIS

This section presents an analysis of the ecological features and functions of the study site and identification of the natural heritage constraints that are present.

Included are an overview of the ecological features and functions of the vegetation communities found on the site, a discussion of significant species and natural features, and an examination of the site's relationship and connectivity to other nearby natural heritage features.

## 4.1. VEGETATION COMMUNITIES & NATURAL FEATURES

The vegetation communities found on this site pose low to medium constraints to the proposed undertaking.

None of the vegetation community types which were found are designated as significant; further to this no natural vegetation community types were found, only Cultural Meadow, Cultural Thicket, and Cultural Woodland.

The Roseland Creek corridor (Polygon 1) is a medium constraint, as it surrounds the only aquatic feature on the study site and provides some linear cover for wildlife. However, this corridor is low quality habitat due to an abundance of non-native species, the channelization of the Creek and hardening of the Creek bed, and the fragmented nature of the corridor, which is routed underground both north and south of Polygon 1. This corridor should be protected from development, and if any work must occur within or adjacent to it the work should include enhancements to the creek's structure and/or the diversity of the surrounding vegetation.

## 4.2. SIGNIFICANT SPECIES & HIGH CONSTRAINT TREES

Significant species and high constraint trees pose a medium to high constraint to the proposed undertaking.

No federally or provincially significant species found during the site visit, and those historically present are unlikely to still exist in this vicinity (see discussion in Section 3.1.2). Three Regionally significant species were found, White Spruce (Picea glauca), Virginia Creeper (*Parthenocissus quinquefolia*) and Sandbar Willow (*Salix exigua*). However, White Spruce had been planted and one may have been the common variety Thicket Creeper ((*Parthenocissus quinquefolia var. quinquefolia*). The two non-planted Regionally significant species are in Polygon 1 and 7, therefore impacts to these communities should be minimized to reduce impacts to these species.

High preservation priority trees are a high constraint and should be preserved. These trees have been given the designation of "high priority" due to large size, species, structure, and/or health; efforts should be made to protect and preserve the high preservation priority trees that were found on the study site. Medium preservation priority trees should be preserved, but can be compensated for by re-planting of native trees. All trees to be preserved should be protected with tree protection fencing to be installed 1.0m outside the trees' driplines and left in place throughout the construction process.

## 4.3. CONNECTIVITY & RELATIONSHIPS

The study area's connectivity and relationships pose a low to medium constraint to the proposed undertaking.

The study area is situated within an urban matrix, bisected by major roads and surrounded largely by commercial development. The Roseland creek corridor provides some connectivity to other natural features, but has been routed underground under the QEW and also under the Burlington Mall just south of the study area. A Small Candidate Significant Woodland is situated close to the study site north of the QEW (see Map 1), but wildlife movement between this woodland and the study site would be severely limited by the QEW. Due to the study area's location close to the shore of Lake Ontario, it would provide some habitat to migratory birds moving through, however breeding habitat would be limited to species highly tolerant of urban conditions.

See Section 5, Recommendations, for specific recommendations for actions to be taken before, during, and after construction to respect these constraints and minimize or mitigate impacts.

# 5. RECOMMENDATIONS

Mitigation of impacts to the study site will include minimizing siltation and encroachment during construction, protection of the significant natural feature along Roseland Creek, preservation of large trees, and timing construction to be sensitive to breeding birds:

- Silt fence should be installed along the limits of construction to minimize siltation and encroachment during construction;
- All construction equipment is to be stored in designated areas outside of the driplines of trees to remain; these areas are to be clearly defined prior to construction start-up;
- Disturbance of the existing vegetation along Roseland Creek should be avoided in order to maintain habitat and shading functions;
- High priority trees should be retained to preserve vegetation structure in the study area; these include tagged trees #605, 643, 644, 649, 653, 657, 956, 989, 994, and 997 (see Appendix 4 and Maps 2a – 2b. Tree 605 is particularly high priority for preservation because it is a native species and the only Shagbark Hickory found on the study site.
- A number of other mature trees are present in Community 7 (see Map 1 for location) which were >10m from the roadway and thus not tagged, but should be preserved because of their size and the cover they provide for birds which may need to perch before flying over the QEW;
- High priority trees to be retained should be protected using tree protection fencing throughout the construction process. This fencing should be located a minimum of 1.0m outside the trees' driplines;
- Clearing of vegetation within the site as part of site preparation should be conducted in the late fall or winter months (September – March) so as not to coincide with the breeding seasons of birds; and
- If construction occurs in the spring, summer, or early fall (March – September), nest sweeps of the site should be conducted prior to construction to ensure that unusually

early or late nesting is not taking place, or that dependent young, even though fully fledged, are not in the area and unable to disperse. If breeding birds are found, construction must be delayed until all young have fledged.

If these recommendations are followed, impacts to the existing natural heritage resources of the site will be minimized.

# 6. CONCLUSION

The scope of D&A's work for this project included Ecological Land Classification vegetation community classification, compilation of a comprehensive vascular plants species list, and an arborist assessment for trees >10 cm DBH. The study area for this project was defined to be the QEW to the north, just south of McDowell Road to the south, South Service Road/Laurentian Drive to the east and Queensway Drive/Glenwood School Drive to the west. The rapid vegetation characterization was carried out for these areas in their entirety, and the tree assessment was undertaken within 10m of the road right-of-way.

The study area has been highly altered from its natural state and the natural heritage features that are present are cultural in nature, having been created and/or maintained by human-generated forces. The vegetation communities found were dominated by non-native species, and those native species found were ones which are capable of colonizing disturbed landscapes and competing with the non-native species found.

Overall, the background review and field investigation found constraints to the proposed undertaking within this study area which can be worked around through conscientious design and construction practices. 10 of the trees tagged during the survey are high constraint; these trees were designated as high preservation priority and should be preserved. The Roseland Creek corridor, the Cultural Woodland in Community 7, and all of the medium preservation priority trees are medium constraint, while the open-canopy areas are low constraint; impacts which may occur to medium and low constraint features should be mitigated through post-construction plantings of native species to compensate for any losses.

Recommendations for actions to be taken before, during, and after construction are provided to minimize impacts to the natural features of this site. Mitigation of impacts can be achieved by protecting the significant natural feature along Roseland Creek, minimizing impacts in the vicinity of locally significant plant species, preventing siltation and encroachment during construction, preserving large trees, and timing construction to be sensitive to the nesting season of breeding birds.

The study area for the Guelph Line/Regional Road 1 improvements is a highly urbanized landscape bisected by roads and dominated by commercial businesses, but one which despite this contains 5.1 ha of naturalized vegetation communities and 101 trees within 10m of its roadways. If the recommendations in this report are implemented, the best natural heritage features and functions of the study area will be preserved and any impacts will be minimized through mitigation and compensation.

## APPENDIX 1 – References


**Halton Region and North - South Environmental Inc. 2005.** Halton Region Environmentally Sensitive Areas Consolidation Report. Unpublished report prepared by Halton Region Planning and Public Works Department in conjunction with North - South Environmental Inc. 222 pp. + app.

**Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P.Ulhig, and S. McMurray. 1998.** Ecological Land Classification for Southern Ontario: First Approximation and its Application. Ontario Ministry of Natural Resources, Southcentral Science Section, Science Development and Transfer Branch. SCSS Field Guide FG-02.)

**Newmaster, S.G., A. Lehela, P.W.C. Uhlig, S. McMurray and M.J. Oldham 1998.** Ontario Plant List. OMNR, OFRI, Sault Ste. Marie, Ontario, Forest Research Information Paper No. 123, 550 pp. + appendices.

**NHIC (Natural Heritage Information Centre). 2009**. NHIC Geographic Query Map. Ontario Natural Heritage Information Centre Home Page: http://nhic.mnr.gov.on.ca/MNR/nhic/queries/nhic.mwf

**NHIC (Natural Heritage Information Centre). 2011.** Ontario Vascular Plant Species List. Biodiversity Explorer Online Database. Ontario Ministry of Natural Resources.

**NHIC (Natural Heritage Information Centre). 2012a.** Srank Definitions. Available online at: http://nhic.mnr.gov.on.ca/MNR/ nhic /glossary/srank.cfm

**NHIC (Ontario Natural Heritage Information Centre). 2012b.** NHIC List of Ontario Birds. Ontario Natural Heritage Information Centre Home Page. Available online at: http://nhic.mnr.gov.on.ca/MNR/nhic/ species/listout.cfm?el=ab

**Natural Heritage Information Centre. 2012c.** Element Summary Report for Ontario Ministry of Natural Resources, Peterborough, Ontario. Available online at: http://www.biodiversityexplorer.mnr.gov.on.ca/nhicWEB/nhicIndex.jsp

**Oldham, M.J., and S.R. Brinker, S.R. 2009.** Rare Vascular Plants of Ontario. Fourth Edition. Natural Heritage Information Centre, Ontario Ministry of Natural Resources, Peterborough, Ontario. 188 pages. Available: http://publicdocs.mnr.gov.on.ca/View.asp?Document_ID=15769&Attachment_ID=33301

**Ontario Ministry of Natural Resources, Fish & Wildlife Branch (MNR). 2000.** Significant Wildlife Habitat: Technical Guide, Appendix G, Wildlife Habitat Matrices and Habitat Descriptions for Rare Vascular Plants. Available online at: http://www.mnr.gov.on.ca/en/Business/FW/Publication/MNR_E001285P.html

**Ontario Ministry of Natural Resources (OMNR). 2009.** Species at Risk in Ontario (SARO) List. (Issued by Ontario Ministry of Resources' Species at Risk Section., Effective February 18, 2009) Available: http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/246809.html

**OMNR (Ontario Ministry of Natural Resources). 2012.** Species at Risk in Ontario (SARO) List. Updated January 13, 2012. Available online at: http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/276722.html

# Appendix 2: Vascular Plant Species and Status List

| Current Scientific Name | Current Common Name | G RANK | COSEWIC | MNR Species At Risk List | S RANK | GTA | Regional Municipality of Halton | CC | CW | Native Status | 1 - CUT, Roseland Creek | 2 - CUW, outside of study area | 3 - CUT, S of S Service Rd | 4 - CUM, N of S Service Rd | 5 - CUM, W of Guelph Line | 6 - CUM, W of Guelph Line, N of Queensway | 7 - CUW, Cloverleaf W of Guelph Line |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Acer negundo | *Box Elder* | G5 | | | S5 | | | | -2 | N | X | X | | | X | | |
| Acer saccharinum | *Silver Maple* | G5 | | | S5 | | | 5 | -3 | N | X | | | | X | | |
| Alliaria petiolata | *Garlic Mustard* | GNR | | | SNA | | | | | I | X | X | | | | X | |
| Arctium minus | *Lesser Burdock* | GNR | | | SNA | | | | 5 | I | X | | | | | | |
| Asclepias syriaca | *Kansas Milkweed* | G5 | | | S5 | | | | 5 | N | X | | X | | X | X | |
| Bromus inermis | *Awnless Brome* | GNR | | | SNA | | | | | I | X | | | X | X | X | X |
| Cichorium intybus | *Chicory* | GNR | | | SNA | | | | 5 | I | | | | | X | | |
| Cirsium vulgare | *Bull Thistle* | GNR | | | SNA | | | | 4 | I | X | X | | | X | X | X |
| Cornus sericea | *Red-osier Dogwood* | G5 | | | S5 | | | | | N | X | X | | | | | |
| Dactylis glomerata | *Orchard Grass* | GNR | | | SNA | | | | 3 | I | X | | | | | | |
| Daucus carota | *Wild Carrot* | GNR | | | SNA | | | | 5 | I | | | X | | X | | |
| Dipsacus fullonum | *Fuller's Teasel* | GNR | | | SNA | | | | | I | X | X | X | X | | X | X |
| Echium vulgare | *Common Viper's-bugloss* | GNR | | | SNA | | | | 5 | I | | | X | X | X | | X |
| Elaeagnus angustifolia | *Russian Olive* | GNR | | | SNA | | | | 4 | I | X | X | X | X | | | |
| Elymus repens | *Creeping Wild-rye* | GNR | | | SNA | | | | 3 | I | X | X | | X | X | | |
| Euonymus alatus | *Winged Spindle-tree* | GNR | | | SNA | | | | | I | X | | | | X | X | |
| Festuca rubra | *Red Fescue* | G5 | | | S5 | | | | | N | | | X | | X | | |
| Fraxinus americana | *White Ash* | G5 | | | S5 | | | 4 | 3 | N | X | | | | | | |
| Gleditsia triacanthos | *Honey-locust* | G5 | | | S2 | | | 3 | | N | | | | X | | | |
| Hypericum perforatum | *A St. John's-wort* | GNR | | | SNA | | | | 5 | I | X | | | | | | |
| Juglans nigra | *Black Walnut* | G5 | | | S4 | | | 5 | 3 | N | X | | | | | X | X |
| Juniperus virginiana | *Eastern Red Cedar* | G5 | | | S5 | | | 4 | 3 | N | | | X | | | | |
| Linaria vulgaris | *Butter-and-eggs* | GNR | | | SNA | | | | 5 | I | X | | X | X | | | |
| Lonicera tatarica | *Tartarian Honeysuckle* | GNR | | | SNA | | | | 3 | I | X | | | | X | X | X |
| Lythrum salicaria | *Purple Loosestrife* | G5 | | | SNA | | | | -5 | I | X | | X | | | | |
| Malus pumila | *Common Apple* | G5 | | | SNA | | | | 5 | I | | X | X | | | | |
| Melilotus albus | *White Sweet Clover* | G5 | | | SNA | | | | | I | | | | | X | | X |
| Morus alba | *White Mulberry* | GNR | | | SNA | | | | | I | X | | | | | | X |
| Nepeta cataria | *Catnip* | GNR | | | SNA | | | | 1 | I | X | | | | | | X |
| Parthenocissus quinquefolia | *Virginia Creeper* | G5 | | | S4? | R | RLR | 6 | 1 | N | X | | | | | | X |
| Phalaris arundinacea | *Reed Canary Grass* | G5 | | | S5 | | | | -4 | N | X | X | | X | | X | |
| Phragmites australis | *Common Reed* | G5 | | | S4? | | | | -4 | N | | | X | | | | X |
| Picea glauca | *White Spruce* | G5 | | | S5 | | U | 6 | 3 | N | | | | X | | | X |
| Picris hieracioides | *Hawkweed Oxtongue* | G5 | | | SNA | | | | | I | X | | | X | X | | |
| Pinus nigra | *Black Pine* | GNR | | | SNA | | | | -5 | I | | | | | | | X |
| Pinus sylvestris | *Scotch Pine* | GNR | | | SNA | | | | 5 | I | | | | | | | X |
| Plantago lanceolata | *English Plantain* | G5 | | | SNA | | | | | I | | | X | | X | | X |
| Populus deltoides | *Eastern Cottonwood* | G5 | | | S5 | | | | | N | X | X | X | | | | |
| Populus grandidentata | *Large-tooth Aspen* | G5 | | | S5 | | | 5 | 3 | N | | | X | | | | |
| Prunus sp | *Cherry Species* | | | | | | | | | | | | | X | | | |
| Prunus virginiana | *Choke Cherry* | G5 | | | S5 | | | | | N | | | X | | | | |
| Quercus alba | *White Oak* | G5 | | | S5 | | | 6 | 3 | N | | | | | | | X |
| Quercus robur | *English Oak* | GNR | | | SNA | | | | | I | | | | | X | | |
| Rhamnus cathartica | *Buckthorn* | GNR | | | SNA | | | | 3 | I | X | X | | | | | |
| Rhus typhina | *Staghorn Sumac* | G5 | | | S5 | | | | | N | X | X | | X | | X | X |
| Robinia pseudoacacia | *Black Locust* | G5 | | | SNA | | | | | I | | | | | | X | |
| Rubus occidentalis | *Black Raspberry* | G5 | | | S5 | | | 2 | 5 | N | X | | | | | | |
| Rumex crispus | *Curly Dock* | GNR | | | SNA | | | | -1 | I | X | X | | X | | X | |
| Salix exigua | *Sandbar Willow* | G5 | | | S5 | | U | 3 | -5 | N | X | | | | | | |
| Salix fragilis | *Crack Willow* | GNR | | | SNA | | | | -1 | I | X | | | | | | |
| Solidago canadensis | *Canada Goldenrod* | G5 | | | S5 | | | 1 | 3 | N | X | X | X | X | X | X | X |
| Symphyotrichum ericoides | *White Heath Aster* | G5 | | | S5 | | | | | N | | | X | | X | | |
| Symphyotrichum lanceolatum | *Panicled Aster* | G5 | | | S5 | | | | | N | X | X | X | | X | | |
| Symphyotrichum novae-angliae | *New England Aster* | G5 | | | S5 | | | 2 | -3 | N | X | X | X | X | | X | X |
| Taraxacum officinale | *Brown-seed Dandelion* | G5 | | | SNA | | | | 3 | I | X | | | | | | |
| Thuja occidentalis | *Eastern White Cedar* | G5 | | | S5 | | | 4 | -3 | N | | | | | X | | |
| Typha latifolia | *Broad-leaf Cattail* | G5 | | | S5 | | | 3 | -5 | N | | | | | | X | |
| Ulmus americana | *American Elm* | G5? | | | S5 | | | 3 | -2 | N | | | | | | | X |
| Ulmus pumila | *Siberian Elm* | GNR | | | SNA | | | | 5 | I | X | | X | X | X | | X |
| Verbascum thapsus | *Great Mullein* | GNR | | | SNA | | | | 5 | I | | | | | | | X |
| Vicia cracca | *Tufted Vetch* | GNR | | | SNA | | | | 5 | I | X | | X | | | | |
| Vitis riparia | *Riverbank Grape* | G5 | | | S5 | | | | -2 | N | X | X | | X | | | X |

# APPENDIX 3: VASCULAR PLANT & SPECIES LIST LEGEND

## Federal Status (COSEWIC)

**Extinct (X)** - A wildlife species that no longer exists.
**Extirpated (XT)** - A wildlife species no longer existing in the wild in Canada, but occurring elsewhere.
**Endangered (E)** - A wildlife species facing imminent extirpation or extinction.
**Threatened (T)** - A wildlife species likely to become endangered if limiting factors are not reversed.
**Special Concern (SC)** - A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.

## MNR Status (OMNR)

**EXP Extirpated.** Any species no longer existing in the wild in Ontario but existing elsewhere.
**END Endangered.** A species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's Endangered Species Act (ESA).
**THR Threatened.** Any native species that, on the basis of the best available scientific evidence, is at risk of becoming endangered throughout all or a significant portion of its Ontario range if the limiting factors are not reversed.
**SC Special Concern** [formerly Vulnerable]. A species with characteristics that make it sensitive to human activities or natural events

## Global Rank (GRANK): (NatureServe 2008, Oldham and Brinker 2009)

Global conservation status ranks (Granks) are assigned by a consensus of the network of natural heritage programs (conservation data centres), scientific experts, and Nature Serve to designate a conservation priority rank based on the range-wide status of a species, subspecies or variety. Global ranks are assigned in a manner similar to that described for provincial ranks (below), but consider these factors throughout the total range of the taxon.

**G1** **Critically Imperiled**—At very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors.
**G2** **Imperiled**—At high risk of extinction due to very restricted range, very few populations (often 20 or fewer populations), very steep declines, or other factors.
**G3** **Vulnerable**—At moderate risks of extinctions due to a restricted range, relatively few populations (often 80 or fewer), recent widespread declines, or other factors.
**G4** **Apparently Secure**—Uncommon but not rare some cause for long-term concern due to declines or other factors.
**G5** **Secure**—Common, widespread and abundant.
**GX** **Presumed Extinct**— Not located despite intensive searches and virtually no likelihood of rediscovery.
**GH** **Possibly Extinct**—Missing; known form only historical occurrences but still some hope of rediscovery.
**GU** **Unrankable**—Currently unrankable due to lack of information or due to substantially conflicting information about status or trends. Whenever possible, the most likely rank is assigned and a question mark qualifier may be added (e.g., G2?)to express minor uncertainty, or a range rank (e.g., G2G3) may be used to delineate the limits (range) of uncertainty.
**GNR** **Unranked**—Global rank not yet assessed (**TNR** – infraspecific taxon not yet ranked).
Rank ranges, e.g. G2G3, indicate that the Global Rank is either G2 or G3, but that the information currently available is insufficient to determine which rank applies.

## Subnational Rank (SRANK): (NHIC 2009, Oldham and Brinker 2009)

Provincial (or subnational) conservation status ranks are used by the NHIC to set conservation priorities for rare species and natural communities. These ranks are not legal designations. The most important factors considered in assigning provincial ranks are the total number of known, extant sites in Ontario, and the degree to which they are potentially or actively threatened with destruction. Other criteria include the number of known populations considered to be securely protected, the size and population trends of provincial occurrences, and the ability of the taxon to persist at its known sites. Hybrids, introduced species, and taxonomically dubious species, subspecies and varieties have generally not been included. By comparing the global and provincial ranks, the status, rarity, and the urgency of conservation needs can be ascertained. Provincial ranks have been assigned using the best available scientific information, and have been reviewed by a group of experts on the flora of Ontario. The NHIC evaluates provincial ranks on a continual basis and produces updated lists, and welcomes information that will assist in assigning accurate provincial ranks.

**S1** **Critically Imperiled**—Critically imperiled in Ontario because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the province.

**S2** **Imperiled**—Imperiled in Ontario because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the province.

**S3** **Vulnerable**—Vulnerable in Ontario due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

**S4** **Apparently Secure**—Uncommon but not rare; some cause for long-term concern due to declines or other factors.

**S5** **Secure**—Common, widespread, and abundant in Ontario.

**SH** **Possibly Extirpated (Historical)—**Species occurred historically in Ontario, and there is some possibility that it may be rediscovered. Its presence in the province has not have been verified in the past 20 or more years.

**SX** **Presumed Extirpated**—Species is believed to be extirpated from Ontario. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.

**?** **Inexact or Uncertain**—Denotes inexact or uncertain numeric rank.

**SNA** **Unranked**—Nation or state/province conservation status not yet assessed.

Rank ranges, e.g. S2S3, indicate that the Ontario rank is either S2 or S3, but that the information currently available is insufficient to determine which rank applies. Rank ranges (e.g. S2S3) are sometimes used to indicate known rank based on number of occurrences (e.g. S2) and predicted rank with additional field surveys (e.g. S3).

### Regional Municipality of Halton:

A rare (R) species occurs at 5 or fewer stations and an uncommon (U) species at 6 to 15 stations.

### GTA (Greater Toronto Area) Status

The GTA includes the Regions of Halton, Peel, the City of Toronto, and the Regions of York, and Durham. Rare (R) species in the GTA occur at 40 or fewer stations; Uncommon (U) species occur at 41 to 80 stations.

### Coefficient of Conservatism (cc) (Oldham *et al*. 1995)

Each native taxon was assigned a rank of 0 to 10 ("coefficient of conservatism") based on its degree of fidelity to a range of synecological parameters. Plants found in a wide variety of plant communities, including disturbed sites, were assigned ranks of 0 to 3. Taxa that typically are associated with a specific plant community, but tolerate moderate disturbance, were assigned ranks of 4 to 6. Rankings of 7 to 8 were applied to those taxa associated with a plant community in an advanced successional stage that has undergone minor disturbance. Those plants with high degrees of fidelity to a narrow range of synecological parameters were assigned a value of 9 to 10.

### Coefficient of Wetness (cw) (Oldham *et al*. 1995)

The wetness index gives an indication of where plant species are typically found. Wetness values (coefficient of wetness) are between -5 and 5.

These categories are defined as follows:

**-5** Occurs almost always in wetlands under natural conditions (estimated > 99% probability).

**-4** to **-2** Usually occurs in wetlands, but occasionally found in non-wetlands (estimated 67-99% probability).

**-1** to **1** Equally likely to occur in wetlands or non-wetlands (estimated 34-66% probability).

**2** to **4** Occasionally occurs in wetlands, but usually occurs in non-wetlands (estimated 1-33 % probability).

**5** Occurs almost never in wetlands under natural conditions (estimated < 1 % probability)

### Native Status (N or I)

This letter refers to the native status of a plant as defined by the Newmaster *et al*, 1998 and Floristic Quality Assessment System for Southern Ontario (M.J. Oldham, W.D. Bakowsky and D.A. Sutherland 1995). "N" indicates that the plant is considered native to this region. "I" indicates that the plant has been introduced from another region.

# Appendix 4: Tree Tagging Data

| Tree Tag Number | Current Common Name | Current Botanic Name | DBH1 (cm) | DBH2 (cm) | DBH3 (cm) | DBH4 (cm) | DBH5 (cm) | Crown Reserve (m) | Height (m) | Biological Health (H/M/L) | Structural Condition (H/M/L) | Preservation Priority (H/M/L) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 601 | Siberian Elm | *Ulmus pumila* | 100 | | | | | 10-15 | 15-20 | H | M | M | |
| 602 | Russian Olive | *Elaeagnus angustifolia* | 15 | 15 | | | | 05-10 | 05-10 | M | L | H | |
| 603 | Siberian Elm | *Ulmus pumila* | 15 | 15 | 10 | | | 05-10 | 05-10 | M | M | M | |
| 604 | Russian Olive | *Elaeagnus angustifolia* | 20 | 15 | 10 | | | 05-10 | 05-10 | M | M | M | |
| 605 | Shagbark Hickory | *Carya ovata* | 50 | | | | | 10-15 | 15-20 | M | H | H | |
| 606 | Norway Maple | *Acer platanoides* | 100 | | | | | 10-15 | 15-20 | H | M | M | |
| 607 | London Plane Tree | *Platanus x acerifolia* | 100 | | | | | 10-15 | 10-15 | M | M | L | Recently pruned on Guelph Line side |
| 608 | White Ash | *Fraxinus americana* | 30 | | | | | 05-10 | 05-10 | L | M | L | |
| 609 | Sugar Maple | *Acer saccharum* | 40 | 30 | 18 | 15 | | 05-10 | 10-15 | L | L | M | Mostly dead |
| 610 | Austrian Pine | *Pinus nigra* | 40 | | | | | 05-10 | 05-10 | M | H | H | |
| 611 | Austrian Pine | *Pinus nigra* | 50 | | | | | 05-10 | 05-10 | M | M | L | |
| 612 | Austrian Pine | *Pinus nigra* | 35 | | | | | 05-10 | 05-10 | M | M | L | |
| 613 | Austrian Pine | *Pinus nigra* | 35 | | | | | 05-10 | 05-10 | L | M | M | Mostly dead |
| 614 | Austrian Pine | *Pinus nigra* | 35 | | | | | 05-10 | 05-10 | M | M | M | |
| 615 | Austrian Pine | *Pinus nigra* | 35 | | | | | 05-10 | 10-15 | M | M | M | Trunk damage (woodpecker?) |
| 616 | Austrian Pine | *Pinus nigra* | 35 | | | | | 05-10 | 03-05 | M | L | L | |
| 617 | Austrian Pine | *Pinus nigra* | 40 | | | | | 05-10 | 10-15 | M | H | L | |
| 618 | White Ash | *Fraxinus americana* | 45 | | | | | 10-15 | 10-15 | M | M | L | |
| 619 | Norway Maple | *Acer platanoides* | 25 | | | | | 05-10 | 05-10 | M | L | M | |
| 620 | Norway Maple | *Acer platanoides* | 20 | | | | | 03-05 | 05-10 | M | H | L | |
| 620 | White Ash | *Fraxinus americana* | 35 | | | | | 05-10 | 05-10 | L | M | M | Possible Emerald Ash Borer |
| 622 | White Ash | *Fraxinus americana* | 20 | 15 | 15 | | | 05-10 | 05-10 | M | L | M | |
| 623 | White Ash | *Fraxinus americana* | 35 | | | | | 05-10 | 10-15 | M | M | M | |
| 624 | White Ash | *Fraxinus americana* | 40 | | | | | 05-10 | 10-15 | M | M | M | |
| 625 | White Ash | *Fraxinus americana* | 40 | | | | | 10-15 | 10-15 | M | H | M | |
| 626 | Colorado Spruce | *Picea pungens* | 45 | | | | | 05-10 | 10-15 | H | H | M | |
| 627 | Norway Maple | *Acer platanoides* | 40 | | | | | 05-10 | 05-10 | M | M | L | |
| 628 | White Ash | *Fraxinus americana* | 20 | | | | | 01-03 | 03-05 | M | M | M | |
| 629 | White Ash | *Fraxinus americana* | 20 | | | | | 03-05 | 05-10 | M | L | L | |
| 630 | White Ash | *Fraxinus americana* | 15 | | | | | 05-10 | 05-10 | M | H | M | |
| 631 | Freeman's Maple | *Acer x freemanii* | 50 | 30 | 20 | 20 | 20 | 10-15 | 15-20 | H | L | M | |
| 632 | Norway Maple | *Acer platanoides* | 35 | | | | | 05-10 | 10-15 | H | H | L | |
| 633 | Siberian Elm | *Ulmus pumila* | 35 | | | | | 10-15 | 10-15 | H | M | M | |
| 634 | Siberian Elm | *Ulmus pumila* | 35 | | | | | 10-15 | 05-10 | M | M | M | |
| 635 | Black Locust | *Robinia pseudoacacia* | 20 | | | | | 05-10 | 03-05 | M | L | L | |
| 636 | Black Locust | *Robinia pseudoacacia* | 30 | | | | | 05-10 | 10-15 | M | M | M | |
| 637 | Black Locust | *Robinia pseudoacacia* | 45 | | | | | 10-15 | 10-15 | M | H | L | |
| 638 | Norway Maple | *Acer platanoides* | 45 | | | | | 05-10 | 05-10 | M | M | L | |
| 639 | Norway Maple | *Acer platanoides* | 40 | | | | | 05-10 | 05-10 | M | M | M | |
| 640 | Black Walnut | *Juglans nigra* | 20 | | | | | 05-10 | 05-10 | M | H | L | |
| 640 | English Oak | *Quercus robur* | 90 | | | | | 05-10 | 05-10 | M | M | L | Very large trunk but small crown |
| 641 | Black Locust | *Robinia pseudoacacia* | 50 | | | | | 10-15 | 15-20 | M | M | M | |
| 642 | Black Locust | *Robinia pseudoacacia* | 45 | 40 | | | | 05-10 | 10-15 | M | L | H | |
| 643 | Black Walnut | *Juglans nigra* | | | | | | 10-15 | 15-20 | H | H | M | |
| 644 | Black Walnut | *Juglans nigra* | 80 | | | | | 10-15 | 15-20 | H | H | H | |
| 645 | Siberian Elm | *Ulmus pumila* | 20 | 10 | 15 | | | 05-10 | 05-10 | M | M | M | |
| 646 | Siberian Elm | *Ulmus pumila* | 25 | | | | | 05-10 | 05-10 | M | M | M | |
| 647 | Austrian Pine | *Pinus nigra* | 40 | | | | | 05-10 | 10-15 | H | H | M | |
| 648 | Austrian Pine | *Pinus nigra* | 40 | | | | | 05-10 | 10-15 | H | M | H | |
| 649 | American Elm | *Ulmus americana* | 20 | | | | | 05-10 | 10-15 | H | H | M | |
| 651 | Siberian Elm | *Ulmus pumila* | 40 | | | | | 05-10 | 10-15 | M | H | M | |
| 652 | Silver Maple | *Acer saccharinum* | 45 | | | | | 05-10 | 10-15 | H | M | H | |
| 653 | Norway Maple | *Acer platanoides* | 50 | | | | | 10-15 | 10-15 | H | H | M | |
| 654 | Norway Maple | *Acer platanoides* | 45 | | | | | 10-15 | 10-15 | H | M | M | |

# Appendix 4: Tree Tagging Data

| Tree Tag Number | Current Common Name | Current Botanic Name | DBH1 (cm) | DBH2 (cm) | DBH3 (cm) | DBH4 (cm) | DBH5 (cm) | Crown Reserve (m) | Height (m) | Biological Health (H/M/L) | Structural Condition (H/M/L) | Preservation Priority (H/M/L) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 655 | Norway Maple | *Acer platanoides* | 40 | | | | | 10-15 | 10-15 | H | M | M | |
| 656 | Norway Maple | *Acer platanoides* | 45 | | | | | 10-15 | 05-10 | M | M | L | |
| 657 | Littleleaf Linden | *Tilia cordata* | 50 | | | | | 10-15 | 10-15 | H | H | H | |
| 658 | Norway Maple | *Acer platanoides* | 20 | | | | | 05-10 | 03-05 | M | M | H | |
| 956 | Siberian Elm | *Ulmus pumila* | 120 | | | | | 10-15 | 15-20 | H | H | L | |
| 957 | Siberian Elm | *Ulmus pumila* | 40 | | | | | 10-15 | 15-20 | M | L | M | |
| 958 | Siberian Elm | *Ulmus pumila* | 45 | 40 | 35 | | | 10-15 | 15-20 | M | M | M | |
| 959 | Siberian Elm | *Ulmus pumila* | 15 | 10 | | | | 03-05 | 05-10 | M | L | M | |
| 960 | Siberian Elm | *Ulmus pumila* | 40 | | | | | 05-10 | 10-15 | M | M | M | |
| 961 | Cottonwood | *Populus deltoides* | 10 | 7 | | | | 03-05 | 05-10 | M | M | M | |
| 962 | Russian Olive | *Elaeagnus angustifolia* | 20 | 10 | | | | 05-10 | 03-05 | M | L | M | |
| 963 | Largetooth Aspen | *Populus grandidentata* | 10 | | | | | 03-05 | 05-10 | M | H | M | |
| 964 | Siberian Elm | *Ulmus pumila* | 10 | 7 | | | | 03-05 | 03-05 | M | M | M | |
| 965 | Siberian Elm | *Ulmus pumila* | 10 | | | | | 03-05 | 03-05 | M | M | M | |
| 966 | Siberian Elm | *Ulmus pumila* | 10 | | | | | 03-05 | 03-05 | M | M | M | |
| 967 | Russian Olive | *Elaeagnus angustifolia* | 20 | 17 | | | | 05-10 | 05-10 | M | L | M | |
| 968 | White Ash | *Fraxinus americana* | 45 | | | | | 05-10 | 05-10 | M | L | M | |
| 969 | Norway Maple | *Acer platanoides* | 35 | | | | | 05-10 | 10-15 | M | M | M | |
| 970 | Black Locust | *Robinia pseudoacacia* | 25 | 20 | 15 | | | 05-10 | 05-10 | H | M | M | |
| 971 | Black Locust | *Robinia pseudoacacia* | 15 | | | | | 03-05 | 05-10 | M | M | M | |
| 972 | Black Locust | *Robinia pseudoacacia* | 16 | 12 | 10 | | | 03-05 | 05-10 | H | M | M | |
| 973 | Colorado Spruce | *Picea pungens* | 15 | | | | | 03-05 | 05-10 | M | M | M | |
| 974 | Austrian Pine | *Pinus nigra* | 20 | | | | | 03-05 | 05-10 | H | M | M | |
| 975 | Austrian Pine | *Pinus nigra* | 25 | | | | | 03-05 | 03-05 | M | M | M | |
| 976 | Austrian Pine | *Pinus nigra* | 35 | | | | | 05-10 | 05-10 | M | M | M | |
| 977 | Austrian Pine | *Pinus nigra* | 25 | | | | | 03-05 | 05-10 | M | M | L | |
| 978 | Austrian Pine | *Pinus nigra* | 45 | | | | | 10-15 | 10-15 | H | H | M | |
| 979 | White Ash | *Fraxinus americana* | 35 | 30 | | | | 10-15 | 10-15 | M | L | M | |
| 980 | Crack Willow | *Salix fragilis* | 25 | | | | | 03-05 | 05-10 | M | L | M | |
| 981 | Crack Willow | *Salix fragilis* | 30 | 20 | 15 | | | 05-10 | 10-15 | M | L | M | |
| 982 | Manitoba Maple | *Acer negundo* | 18 | | | | | 03-05 | 03-05 | M | L | M | |
| 983 | Manitoba Maple | *Acer negundo* | 20 | | | | | 03-05 | 03-05 | M | L | M | |
| 984 | Manitoba Maple | *Acer negundo* | 20 | | | | | 05-10 | 05-10 | M | M | M | |
| 985 | Siberian Elm | *Ulmus pumila* | 20 | 20 | | | | 03-05 | 05-10 | M | M | M | |
| 986 | Manitoba Maple | *Acer negundo* | 35 | | | | | 05-10 | 10-15 | M | M | M | |
| 987 | White Mulberry | *Morus alba* | 20 | 15 | 10 | 10 | | 03-05 | 05-10 | H | M | M | |
| 988 | White Willow | *Salix alba* | 30 | 25 | 20 | | | 05-10 | 10-15 | M | L | M | |
| 989 | Cottonwood | *Populus deltoides* | 25 | | | | | 05-10 | 10-15 | M | M | M | |
| 990 | White Willow | *Salix alba* | 20 | | | | | 03-05 | 05-10 | M | M | L | |
| 991 | White Willow | *Salix alba* | 20 | | | | | 05-10 | 05-10 | M | L | M | |
| 992 | White Willow | *Salix alba* | 0 | | | | | 05-10 | 05-10 | M | L | M | |
| 993 | Black Walnut | *Juglans nigra* | 30 | | | | | 03-05 | 05-10 | M | M | M | |
| 994 | Black Walnut | *Juglans nigra* | 18 | | | | | 03-05 | 05-10 | H | H | H | |
| 995 | Cottonwood | *Populus deltoides* | 40 | | | | | 10-15 | 15-20 | M | H | L | |
| 996 | Black Walnut | *Juglans nigra* | 15 | | | | | 05-10 | 05-10 | M | M | L | |
| 997 | Black Walnut | *Juglans nigra* | 15 | | | | | 03-05 | 05-10 | H | H | L | |
| 998 | Black Walnut | *Juglans nigra* | 15 | 8 | | | | 03-05 | 05-10 | H | M | M | |

Legend

DBH: Diameter at Breast Height (1.2m above ground level), in cm. DBH 1, 2, 3, 4, 5 refers to additional trunks >10cm DBH on multi-stemmed trees

Crown Reserve: Approximate diameter of crown, in meters

Height: Approximate height, in meters

Biological Health: Low, Medium, High

Structural Condition: Low, Medium, High

Preservation Priority: Low, Medium, High

# APPENDIX 5 – NHIC Query

A NHIC query was conducted for the study site on October 15, 2012. The study site is located within the NHIC squares 17NJ90-60, 17NJ90-70, 17NH99-79, and 17NH99-69 as shown in the screen shot below:

The NHIC records list a total of 16 species which have been recorded in this square from 1889 to 2001. These records include one mammal (Eastern Pipistrelle), one bird (Black-crowned Night-heron), two fishes (Bloater and Shortnose Cisco), one reptile (Timber Rattlesnake), one odonate (Arrowhead Spiketail) and ten plants (Puttyroot, Downy Yellow False Foxglove, Brainerd's Hawthorn, Northern Hawthorn, Burning Bush, Yellow Stargrass, Virginia Lungwort, Bowman's-root, Shiny Wedge Grass, and Perfoliate Bellwort). A summary of this data is included in the following table:

Ontario

Natural Heritage Information Centre

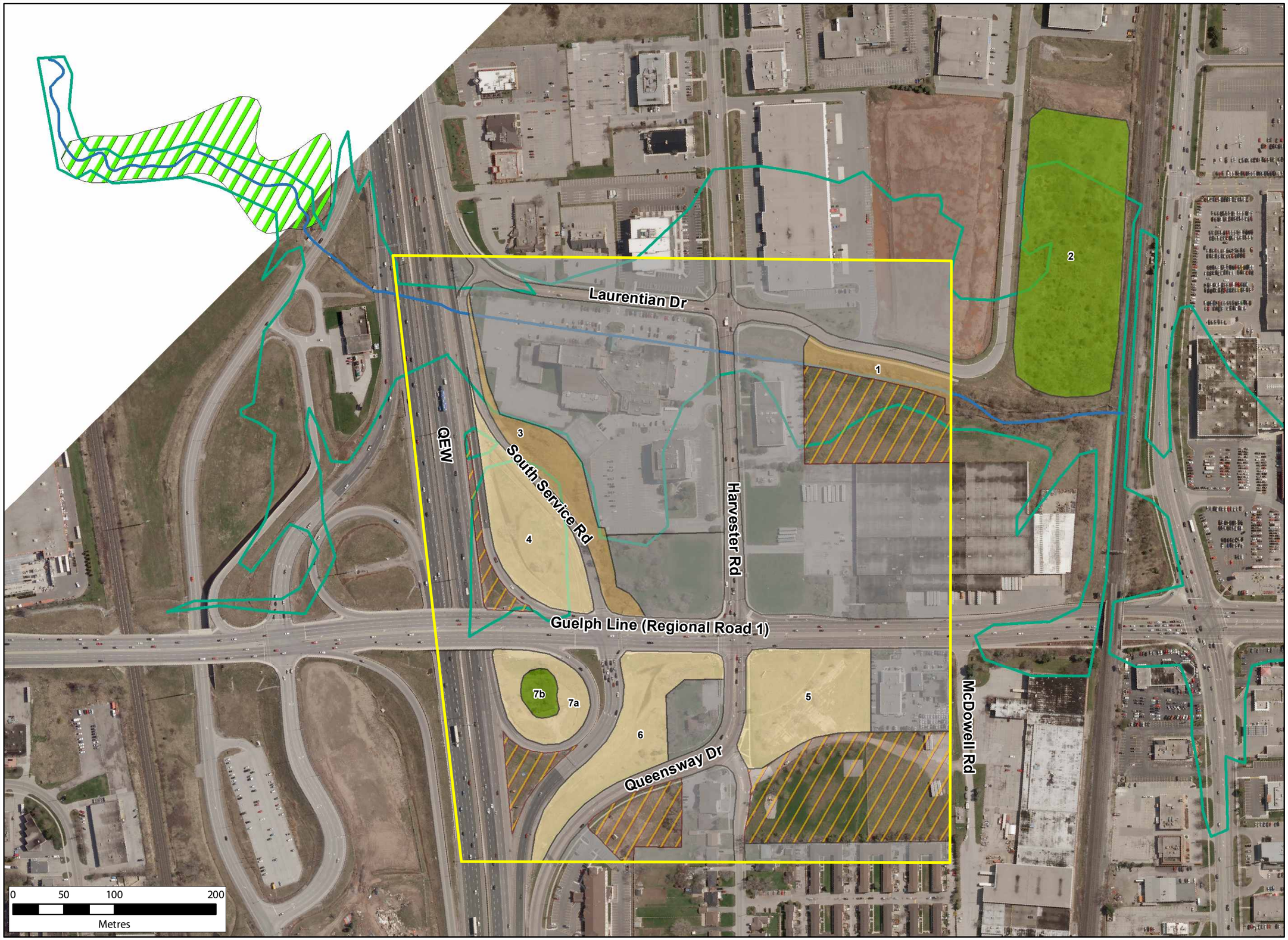
Biodiversity Explorer

**Species**
**Element Occurrence Search** (16 records found)

**Sort Order** Phylogenetic Ascending help

| Taxon | Family | Scientific Name | Common Name | Rank | | At Risk Status | | # of EOs | EO Summary Report |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Global (G-rank) | Ontario (S-rank) | Committee on the Status of Endangered Wildlife in Canada (COSEWIC) | Species At Risk in Ontario (SARO) | | |
| Mammals | Vespertilionidae | *Pipistrellus subflavus* | Eastern Pipistrelle | G5 | S3? | | | 1 | |
| Birds | Ardeidae | *Nycticorax nycticorax* | Black-crowned Night-herc | G5 | S3B,S3N | | | 1 | |
| Reptiles and Turtles | Viperidae | *Crotalus horridus* | Timber Rattlesnake | G4 | SX | EXP | EXP | 1 | |
| Fish | Salmonidae | *Coregonus hoyi* | Bloater | G4 | S4 | NAR | NAR | 1 | |
| Fish | Salmonidae | *Coregonus reighardi* | Shortnose Cisco | GH | SH | END | END | 1 | |
| Dragonflies and Damselflie | Cordulegastridae | *Cordulegaster obliqua* | Arrowhead Spiketail | G4 | S2 | | | 1 | |
| Moncotyledons | Orchidaceae | *Aplectrum hyemale* | Puttyroot | G5 | S2 | | | 1 | |
| Dicotyledons | Scrophulariaceae | *Aureolaria virginica* | Downy Yellow False Foxg | G5 | S1 | | | 1 | |
| Dicotyledons | Rosaceae | *Crataegus brainerdii* | Brainerd's Hawthorn | G5 | S2 | | | 1 | |
| Dicotyledons | Rosaceae | *Crataegus dissona* | Northern Hawthorn | G4G5 | S3 | | | 1 | |
| Dicotyledons | Celastraceae | *Euonymus atropurpurei* | Burning Bush | G5 | S3 | | | 1 | |
| Moncotyledons | Liliaceae | *Hypoxis hirsuta* | Yellow Stargrass | G5 | S3 | | | 1 | |
| Dicotyledons | Boraginaceae | *Mertensia virginica* | Virginia Lungwort | G5 | S3 | | | 1 | |
| Dicotyledons | Rosaceae | *Porteranthus trifoliatus* | Bowman's-root | G4G5 | SX | | | 1 | |
| Moncotyledons | Poaceae | *Sphenopholis nitida* | Shiny Wedge Grass | G5 | S1 | | | 1 | |
| Moncotyledons | Liliaceae | *Uvularia perfoliata* | Perfoliate Bellwort | G5 | S1 | | | 2 | |

Export by Spatial Boundary | Export by Element | Export All EOs




## Legend

Study Area Limits

**MNR Linear Water Data**

Roseland Creek

**Regional Greenlands Data**

Limits of Greenlands A

**Regional Woodlands Data**

Candidate Significant Woodlands

**Vegetation Communities**

**ELC Code**

CUM

CUT

CUW

ANTH

Roads

No data

**ELC Vegetation Communities**

DOUGAN & ASSOCIATES
ECOLOGICAL CONSULTING & DESIGN
77 Wyndham Street South • Guelph ON N1E 5R3
T 519.822.1609 • F 519.822.5389 • www.dougan.ca

PROJECT: GUELPH LINE (REGIONAL ROAD 1) EA

CLIENT: REGIONAL MUNICIPALITY OF HALTON

DATE: SEPTEMBER 2012

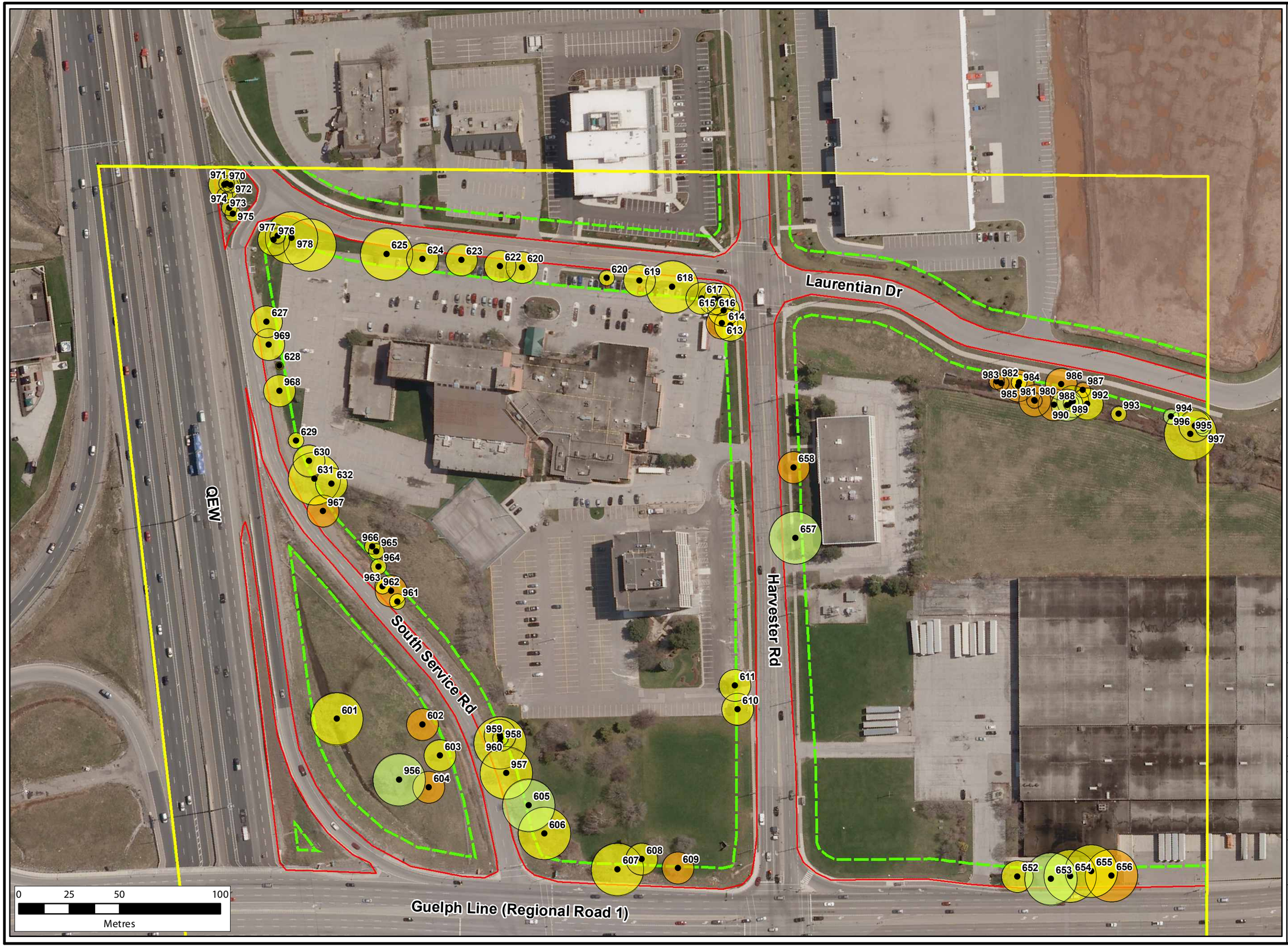
SCALE: 1:3,500

DRAWN BY: MAY

CHECKED BY:

UTM Zone 17 NAD83

Map: 1




## Legend

- Study Area Limits
- Roads
- 10m buffer

**Tree Assessment**

- Tree Tag Number

**Preservation Priority**

- High
- Medium
- Low

**Tree Assessment**

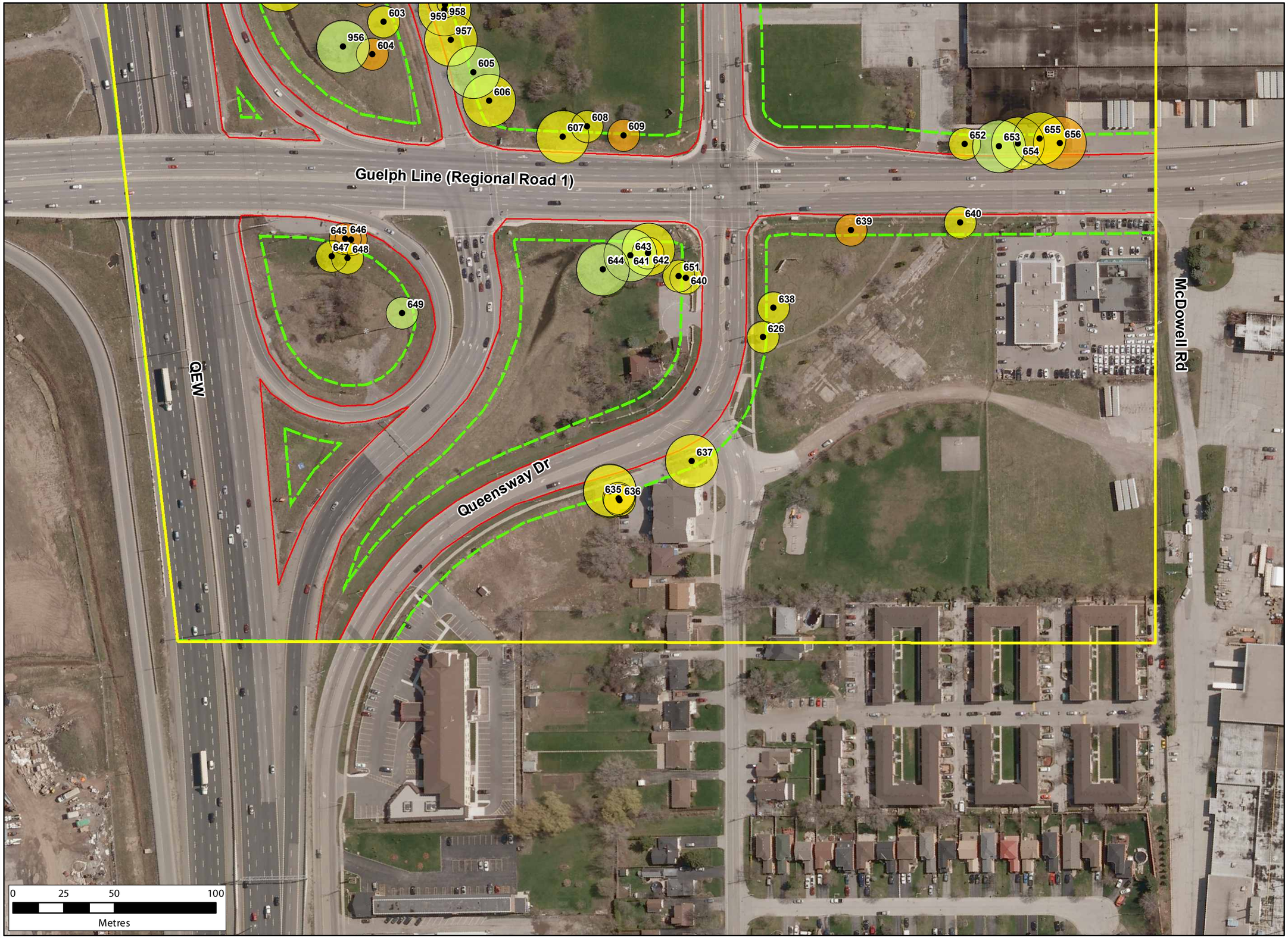

DOUGAN & ASSOCIATES
ECOLOGICAL CONSULTING & DESIGN
77 Wyndham Street South • Guelph ON N1E 5R3
T 519.822.1609 • F 519.822.5389 • www.dougan.ca


PROJECT: GUELPH LINE (REGIONAL ROAD 1) EA

CLIENT: REGIONAL MUNICIPALITY OF HALTON

| | |
|---|---|
| | DATE: SEPTEMBER 2012 |
| | SCALE: 1:1,750 |
| | DRAWN BY: MAY |
| UTM Zone 17 NAD83 | CHECKED BY: |

Map: 2b




## Legend

- Study Area Limits
- Roads
- 10m buffer

**Tree Assessment**

- Tree Tag Number

**Preservation Priority**

- High
- Medium
- Low

# Tree Assessment

DOUGAN & ASSOCIATES
ECOLOGICAL CONSULTING & DESIGN
77 Wyndham Street South • Guelph ON N1E 5R3
T 519.822.1609 • F 519.822.5389 • www.dougan.ca

PROJECT: GUELPH LINE (REGIONAL ROAD 1) EA

CLIENT: REGIONAL MUNICIPALITY OF HALTON

DATE: SEPTEMBER 2012

SCALE: 1:1,750

DRAWN BY: MAY

CHECKED BY:

UTM Zone 17 NAD83

Map: 2b