



# Avondale and Blue Water Development

## Tree Inventory and Preservation Plan

Prepared for:

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**NATURAL RESOURCE SOLUTIONS INC.**

Aquatic, Terrestrial and Wetland Biologists

# Avondale and Blue Water Development Tree Inventory and Preservation Plan

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## 1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained by Bloomfield Development Inc. (the “Client”) to undertake a Tree Inventory and Preservation Plan (TIPP) for a proposed residential development at the addresses of 105 Avondale Court and 143 Blue Water Place (the “subject properties”) in the City of Burlington. This follows a Tree Inventory memo submitted December 15, 2015 and a Preliminary Tree Preservation Plan report submitted May 12, 2016, both to First Urban Inc. The latter of these stated the need to be confirmed and/or updated after a final development plan was available. The owner of these properties and proponent of the redevelopment has changed, and a new development layout has been prepared after hearings at the Ontario Municipal Board and consultations with City of Burlington staff and the public. The landowner is proposing to develop the properties as an eight-lot residential subdivision comprised of detached homes and a cul-de-sac extending from the existing Blue Water Place. The TIPP was submitted on January 28, 2019. This March 2019 version provides revised *Conditions of Tree Assessment* in Appendix III, and a re-analysis of tree retention/removal based on minor changes to the concept plan, following comments from the City of Burlington on March 1, 2019.

The subject properties are approximately 1.6 hectares in size. The majority of the subject properties are legally described as Lot 24 of Judge’s Plan 1233 in the City of Burlington. The two parcels comprising the subject properties (presently zoned R1.2) each have one existing residential building and landscaped yards, with hedgerows and naturalized wooded areas around a drainage ditch and toward the Lake Ontario shore.

The City of Burlington does not have a By-law that regulates trees on private property, but Appendix 1 of the Development Application Pre-Consultation Form dated October 3, 2018 states that a TIPP is “required when a property under application contains woodlots, tree stands or hedgerows, in accordance with Part II, Section 6.0 of the City’s Official Plan and Part IV, Sections 146-147 of the Regional Official Plan.” The TIPP was conducted in accordance with comments made by the City of Burlington, Halton Region, and Conservation Halton in the Pre-Consultation Form and the Pre-Submission Checklist.

This report provides the findings of the tree inventory, analysis of development plans against the overall health and the structural integrity (referring to the potential for structural failure) of trees, protection measures for trees to be retained, and recommended mitigation and compensation

measures. The tree data and mapping has been compared to the layout of the concept plan prepared by Urban Solutions Planning and Land Development Consultants Inc. (U/S File Number 294-18; March 15, 2019). Map 1 displays the tree inventory data overlaying the plan, which includes the lot layout and building footprints, road network, open space block and trees inventoried. The existing overall health and/or potential for structural failure was compared to the layout to determine whether existing trees would be impacted by the proposed undertaking. Avoidance, mitigation, and protection measures for trees were examined to determine which trees would be impacted and which could be retained. In the case of trees requiring removal, compensation for removal is discussed.

This report summarizes the following:

- Findings of the tree inventory,
- Assessment of overall health and potential for structural failure of inventoried trees,
- Tree retention analysis based on details of the proposed development,
- Protection measures for trees to be retained, and
- Recommended mitigation and compensation measures.

## 2.0 Tree Inventory and Methodology

A comprehensive inventory of trees  $\geq 10\text{cm}$  in Diameter at Breast Height (DBH) on and within 3m of the subject properties was first completed by NRSI Certified Arborists on September 24, October 8 and 27, 2015. In order to update the tree inventory data after a change in property ownership and the proposed development layout, NRSI staff was directed by City of Burlington staff to re-visit the site to assess notable changes to previously inventoried trees, identify trees that were not previously inventoried but have attained a DBH of  $\geq 10\text{cm}$  since the initial field work, and to search for Butternut (*Juglans cinerea*) trees on adjacent properties up to 25m from the subject properties (Tania Dowhaniuk, pers. comm. December 17, 2018). This additional field work was completed on January 3, 2019.

Individual trees that were  $\geq 10\text{cm}$  DBH were tagged with a pre-numbered aluminum forestry tag and assessed by a Certified Arborist, and their locations were subsequently surveyed using an SXBlue II GNSS GPS unit; trees outside of the subject properties were not tagged but were assigned an alpha-identifier. Map 1 shows all inventoried trees and a complete list of the trees that were assessed and their overall health and potential for structural failure is included in Appendix I.

The following information was recorded for each tree:

- Species,
- DBH measurement (centimetres),
- Crown radius (metres),
- General health (excellent, good, fair, poor, very poor, dead),
- Potential for structural failure (low, medium, high),
- Tree location (e.g. on-property/off-property, Lot or Block number), and
- General comments (i.e. disease, aesthetic quality, development constraints, sensitivity to development).

The overall health of each tree and the potential for structural failure was assessed based on the criteria outlined in Appendix II. In carrying out these assessments, NRSI has exercised a reasonable standard of care, skill and diligence as would be customarily and normally provided in carrying out these assessments. The assessments have been made using accepted arboricultural techniques. These include a visual examination of each tree for structural defects,

scars, external indications of decay such as fungal fruiting bodies, evidence of insect attack, the condition of any visible root structures, the degree and direction of lean (if any), the general condition of the tree(s) and the surrounding site, and the current or planned proximity of property and people. None of the trees examined on the property were dissected, cored, probed, or climbed and detailed root crown examinations involving excavation were not undertaken. The conditions for this assessment, including restrictions, professional responsibility, and third-party liability can be found in Appendix III.

## **2.1 Butternut Search**

Butternut is designated as federally and provincially Endangered (OMNRF 2016), this species is therefore protected under policies of the *Endangered Species Act* (ESA, 2007). During initial field work in 2015, Butternuts were identified in the course of the tree inventory, as Certified Arborists were looking closely at trees on and adjacent to the subject properties. In 2019, a visual search was conducted for Butternuts on adjacent properties up to 25m from the subject properties' boundaries. A Certified Arborist knocked on doors and accessed neighbouring properties where permission was granted. Where permission could not be obtained, the Certified Arborist used binoculars to search adjacent properties as best as circumstances allowed.

### 3.0 Summary of Tree Inventory

A total of 332 trees were inventoried, comprised of 54 species—a great diversity resulting from the mix of native wooded cover, hedgerows and landscape specimens. Of the trees inventoried and assessed, 129 (38.9%) are native species and 203 (61.1%) are non-native. Additionally, a hedgerow of approximately 46 Eastern White Cedars (*Thuja occidentalis*) was recorded as a polygon at a property boundary near to the existing building at 143 Blue Water Place. One Black Willow (*Salix nigra*, tree A) was observed near the Lake Ontario shore, an uncommon species in Ecodistrict 7E-4; and 1 American Sycamore (*Platanus occidentalis*, tree 600), a rare species in Ecodistrict 7E-4, was inventoried (Oldham 2017). Owing to the time elapsed since the land uses of the subject properties last changed, a number of mature trees are present: 53 inventoried trees were greater than 50cm DBH. Since the initial tree inventory was conducted in 2015, 3 large trees have completely failed; these are accounted for in the data and discussion herein. A complete list of trees inventoried is provided in Appendix I and tree locations within the subject properties are shown on Map 1. Appendix IV presents the inventory data in 2 summary tables.

#### 3.1 Butternuts

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

In 2015, 12 Butternut specimens were recorded on or adjacent to the subject properties. These were assessed by a BHA and a Butternut Health Assessor's Report (#465-001) was prepared. Using a combination of field hybridity tests based on morphological traits of plant parts and a conversation with a resident that described some of the land use history, the BHA report concluded that the 12 Butternuts were either planted specimens or genetic hybrids, none of which are protected by the ESA or the associated O.Reg. 242/08.



However, on October 7, 2016 Bohdan Kowalyk, District Planner with Aurora District of the MNRF visited the site with NRSI staff to review the assessments of the Butternuts and advised genetic testing for some of the trees. After some delays with the project, a BHA assessed the 12 Butternuts again on July 10, 2018 to confirm their condition, update pertinent data, and collect tissue samples for genetic testing. A summary of the results of these assessments and genetic tests is presented in Table 1; 5 of the Butternuts are protected under the ESA, as shown on Map 2.

**Table 1. Genetics and Categorization of Butternuts**

<b>Butternut (per BHA Report 465-001)</b>	<b>Tree Inventory Identifier</b>	<b>Genetics</b>	<b>Butternut Category</b>	<b>Notes</b>
1	501	Hybrid	2	Not protected under ESA (2007)
2	502	Pure	2	Retainable
3	503	Pure	2	Retainable
4	B	Pure	2	Dead as of July 10, 2018
5	C	Pure	2	Cultivated
6	D	Pure	3	Cultivated
7	E	Pure	1	Cultivated
8	F	Pure	3	Archivable
9	530	Hybrid	3	Not protected under ESA (2007)
10	509	Pure	3	Archivable
11	X	Hybrid	1	Non-retainable
12	DD	Pure	2	Retainable

No additional Butternuts were observed on or within 25m of the subject properties on January 3, 2019. The adjacent properties are relatively open landscaped residential yards, allowing for reasonable visibility from property boundaries. It is expected that if a Butternut were present as an element of a landscaped yard, it would have been observed.

#### **4.0 Tree Removal and Retention Analysis**

The development plan for the subject properties has had many iterations before arriving at the proposed 8-lot development with detached homes, in response to planning considerations, stakeholder concerns, and species at risk. The present development plan will result in fewer tree removals than earlier concept plans would have. Efforts have been made to retain trees at the margins of the proposed development plan and to limit the impact on habitat zones of Category 3 Butternuts by, for example, re-working the grading plan, use of a French drain in Lots 7 and 8, a retaining wall proposed at the rear of Lots 5 and 6, and directing flow to a Low Impact Development (LID) feature below Lot 6.

Following these mitigating measures, tree removal and retention was based on two considerations:

- 1) Trees identified as having a high potential for structural failure or poor or very poor health, or identified as dead. The removal of these trees may be recommended for safety, especially if they are located within striking distance of a component of the proposed development, or existing off-site sidewalks, roads or buildings.
- 2) Trees that require removal based on the extent of proposed site grading and other construction activities. This was determined by comparing the location of the trees to the location of the components of the development proposal as shown on Map 1, and account for the majority of recommended removals.

This analysis has been based on the best information available to date. The widening of Blue Water Place and installation of services in the east side of the right-of-way (ROW) will have impacts to adjacent trees but the details of the placement and installation methods of servicing are to be finalized. Boring below tree root systems may be viable for the installation of some services in order to retain more trees; if this option is considered, attention must be paid to the guidelines set out in Appendix II of the Site Plan Application Guidelines (2005).

Of the 332 trees inventoried, 135 are anticipated to be removed. This includes just 1 tree that has been recommended for removal solely as a result of its condition and position. The remaining 134 trees require removal primarily based on the extent of the proposed site plan and siting of necessary services, which are required to effectively develop and drain the lands. This includes trees situated along the grading limit or in close proximity that may incur severe root

damage as a result of grading. Most of these trees are in fair health with a low to medium potential for structural failure, and range in size from 10.8cm DBH to 103.6cm DBH.

Additionally, the hedgerow of approximately 46 Eastern White Cedars will require removal to facilitate construction and grading in Lot 8; these hedgerow trees are close to or on the property boundary. Chapter F.26 of the *Forestry Act* (1990) states that it is an offence to injure or destroy a tree growing on the boundary between adjoining lands without the consent of the land owners. Therefore, prior to the removal of trees in this hedgerow—or trees that could be construed as shared or private property (e.g. along Blue Water Place)—consent must be secured from adjacent landowner(s).

#### **4.1 Butternut Impact**

The proposed development will necessitate the removal of 1 Butternut (tree 502 – Butternut #2) and potential harm to 3 others (trees 503, 509, and DD – Butternut #3, 10, and 12, respectively) in the form of grading and disruption of the 25m habitat buffer around each protected tree (see Maps 1-3). One of the protected Butternut trees (tree F – Butternut #8) will remain unharmed.

One of the potentially harmed Butternuts (tree 509 – Butternut #10) is a Category 3, “archivable” tree. In order that an Overall Benefit Permit under the ESA will not be required, the areal extent of grading impact in the 15-25m habitat zone of Category 3 trees must be  $\leq 200\text{m}^2$  (Bohdan Kowalyk, pers. comm. July 9, 2018). The proposed lot lines at the rear of Lots 5 and 6 overlap the 25m-radius habitat area of tree 509 by  $195\text{m}^2$  and no development works will take place beyond the lot lines in this area, thereby satisfying this requirement.

The remaining Butternuts to be impacted by the proposed development (trees 502, 503, DD – Butternut #2, 3, and 12, respectively) are Category 2 trees, only slightly affected by Butternut canker and therefore considered “retainable”. Because the number of Category 2 Butternuts that may require removal to accommodate the proposed development total fewer than 10 trees, the activity is exempt by Section 9(1)(a) of the ESA and an ESA permit is not required. Rather, the activity that would cause Butternut impact is eligible for MNRF authorization under Section 23.7 of O.Reg. 242/08 whereby the activity is registered with the MNRF using the “Notice of Butternut Impact” form on the MNRF Registry. Activity registration must be completed a minimum of 30 days following submission of the BHA Report to the MNRF. The Notice of Butternut Impact form specifies the number of Category 2 trees to be removed, whether they will be killed or harmed, the location and DBH of each tree, and the date and report number of the

BHA report. Butternut removal may occur following MNRF confirmation that the Notice of Butternut Impact form has been received by the MNRF.

As a condition of Category 2 Butternut removals, Section 23.7 outlines requirements for compensation that must be followed. For each tree that is killed, removed or harmed, various numbers of Butternut seedling plantings will be required, with the specific number depending on the DBH or height of the Butternuts that were removed. See Section 5.1 for an assessment of Butternut compensation plantings required based on the number of existing Butternuts that will be removed or impacted to accommodate the proposed development. All Butternut seedling plantings must be completed within three years of the Notice of Butternut Impact form submission.

In accordance with O.Reg. 242/08 Section 23.7, all Butternut compensation plantings must be managed and monitored annually for two years to assess tree health and success of establishment. This will include weekly tending activities in the first year after planting such as maintaining tree guards, adjacent vegetation control, and watering as necessary, as described in Section 23.7(11) of the Regulation. A record of planting, monitoring and tending must be maintained and provided to the MNRF upon request.

## **5.0 Tree Compensation Plan**

The City of Burlington does not have a By-law that sets out the requirements for replanting on private property. It is recommended that trees proposed for removal that have a high potential for structural failure and/or are in poor to very poor health or are dead be exempted from compensation requirements. Further, the compensation approach described in Section 9.4 of the City's Site Plan Application Guidelines (2005) applies to deciduous trees with a caliper of  $\geq 150\text{mm}$  and coniferous trees taller than 4.5m. 52 of the 135 trees recommended for removal should not require compensation based on the above criteria and recommendation. A complete list of inventoried trees, including a determination of whether trees require compensation, is provided in Appendix I.

A Conceptual Landscape Plan has been developed for the property that provides for the planting of 44 landscape and street trees in the proposed development. It is recommended that some compensation plantings be used to reproduce the screening function from adjacent properties that is presently performed by some boundary trees to be removed (e.g. Eastern White Cedar hedgerow).

### **5.1 Butternut Compensation**

Each of the 3 Category 2 Butternuts to be taken or harmed by way of infringements and grading within their habitat areas have a DBH  $>15\text{cm}$ . According to clause 10(1)(iii) of Section 23.7 of O.Reg. 242/08, at least 20 Butternut seedlings must be planted for 1 Butternut to be taken (i.e. removed). Clause 10(2)(iii) states that for each of the 2 Butternuts to be harmed, at least 10 Butternut seedlings shall be planted, totaling at least 40 Butternut seedlings. These plantings shall adhere to the other stipulations of clause 10 detailing such things as the source of plant material and timing of transplant, and notably that, in order to avoid a monoculture of Butternut, deciduous trees and shrubs that are native to the area shall be planted in equal number to the Butternut seedlings planted. This means that at least 40 Butternut seedlings and 40 trees and shrubs of other species shall be planted as a result of the proposed harm to existing Butternuts on or adjacent to the subject properties.

## **6.0 Tree Protection Measures and Recommended Mitigation**

### **6.1 Prior to Construction**

The need for, and specifications of, barriers protecting trees to be retained from development works are outlined in the City of Burlington's Tree Protection and Preservation (Spec. No. SS12A) document. Temporary tree protection fencing (TPF) will be situated where trees are adjacent to the limit of disturbance/grading, as shown on Map 3. A combined sediment and erosion control fence (i.e. silt fence) and TPF is recommended adjacent to the limit of disturbance, especially at the rear of Lots 3 to 6 where land begins to slope toward Lake Ontario or the drainage ditch at the east property boundary. This TPF is to take the form of 1200mm tall orange plastic snow fencing on wooden 2"x4" frame. Where orange plastic snow fencing restricts sightlines, paige wire fencing with reflective tape can be used.

The temporary TPF will be installed and maintained by the Developer. Prior to any construction activities (e.g. grading, vegetation and tree removal), the TPF will be installed outside the Minimum Tree Protection Zone (MTPZ) of trees to be retained—as defined in Spec. No. SS12A—in order to protect their root systems, and will remain in place for the duration of the project. Supports and bracing of the TPF should be located outside the MTPZ in a manner that minimizes damage to roots. In some cases, TPF locations on Map 3 are within the MTPZ or dripline of trees to be retained because an effort has been made to retain as many trees as possible while considering the practical needs of the proposed construction (e.g. trees 559, 561, 762-763, I-M). It is anticipated that such trees will survive development impacts if these are limited to areas outside the TPF.

Prior to works commencing on-site, fence installation and location is to be inspected by a Certified Arborist and/or the on-site Environmental Monitor. A sign (minimum 10" x 14") indicating the purpose of protection fencing will be attached to the most visible side of the TPF in a place where it can be seen by those entering the site (see example in Spec. No. SS12A).

The TIPP is to be reviewed and approved by the City of Burlington. Upon approval of the TIPP, and prior to any on-site works (i.e. rough grading, tree removal), a qualified environmental consultant is to submit written verification to the City that all of the recommended tree protection measures have been installed in accordance with the TIPP.

## **6.2 During Construction**

Temporary TPF is to be maintained by the Developer during the entire construction period to ensure that trees being retained and their root systems are protected. Within the zone protected by the TPF, no equipment or materials shall be allowed to damage any limbs or branches overhanging the construction area, no soil or construction materials shall be piled, no vehicular traffic or refueling is allowed, and no grading or excavation shall take place, as per Appendix II of the Site Plan Application Guidelines (2005).

Any minimal damage (i.e. damage to limbs or roots) to trees to be retained during construction must be pruned using proper arboricultural techniques. Should any of the trees intended to be retained be seriously damaged or die as a result of construction activities, the owner will remove and replace the tree at their own expense. Replacement species are to be reviewed by a member in good standing of the Ontario Association of Landscape Architects (OALA) or Certified Arborist. Watering and pruning of newly planted trees will be carried out by the owner/contractor as required during the warranty period (approximately 2 years).

### **6.2.1 Migratory Birds Convention Act**

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

Historically, the implementation policies of the MBCA provided for biologists to conduct nest searches when vegetation removals were to occur during the nesting period. These provisions were revoked in 2014. One exception is for when the removals are to occur in simple habitats which are characterized in the MBCA (e.g. bridge structures, isolated trees, vacant lot). Because trees proposed to be removed are mostly from yards or hedgerows, the subject properties might be classified as a 'simple habitat'. Should tree removal be required to occur within the peak breeding window, pending discussion and approval by the CWS, nest surveys may be conducted by a qualified biologist just prior to the removal activity (less than 48 hours

prior to) to ensure that nesting birds are not present. Should a nest be identified within a tree(s) to be removed, there shall be no removal or construction activity until sign-off is obtained from the qualified biologist that the nest is no longer active. Trees identified as having no nesting activity can be removed; however, tree removal is to occur within 48 hours of the nest search. If tree removal does not occur within this time frame, additional nest searches are to be conducted.

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

### **6.3 Post-Construction**

It is recommended that the temporary TPF be removed upon completion of construction activities and any areas of bare soil within the construction area (including any disturbance associated with retaining wall installation), are to be re-vegetated as soon as feasible to prevent erosion of soils and keep dust to a minimum.

### **6.4 Mitigation**

The recommendations provided below are aimed at protecting retained trees and nearby natural features. Species used for compensation plantings, with the possible exception of street trees, should be native to Halton Region and not include any species that are listed as introduced. The use of hardy species will ensure successful early establishment and minimize the potential for invasive species proliferation. For street tree plantings, the use of non-native species that are sometimes more tolerant of urban conditions (i.e. salt and drought tolerant) may be suitable as long as they do not include invasive species such as the often-planted Norway Maple (*Acer platanoides*). Requirements of landscape plan and design considerations are outlined in the City's Site Plan Application Guidelines (2005).

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

- Tree species to be situated in close proximity to roads should be salt tolerant,
- Avoid Ash species due to the risk of the Emerald Ash Borer (*Agilus planipennis*),
- All plant material is to conform to the latest edition of the *Canadian Nursery Trades Association Specifications and Standards*,



- Plantings installed as per specifications outlined in planting plans to be prepared by a member in good standing of the OALA or Certified Arborist (e.g. place a minimum of 10cm of shredded pine-bark mulch or equivalent around all planted material),
- Spacing of plant material should account for the ultimate size and form of the selected species and also the purpose of the planting, whether it be for screening, shade, naturalizing, rehabilitation, etc.,
- Special attention to location and height of trees in proximity to utilities, and
- Ensure that there is sufficient soil volume for all plantings.

## 7.0 References

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**MAPS**

**APPENDIX I**      Tree Inventory Data

**APPENDIX II**      Tree Assessment Criteria

<b>Assessment Criteria</b>	<b>Definition<sup>1</sup></b>
<b>Health Rating*</b>	
Excellent	Represents a tree in near perfect form, health, and vigour. This tree would exhibit no deadwood, no decline, and no visible defects.
Good	Represents a tree ranging from a generally healthy tree to a near perfect tree in terms of health, vigour and structure. This tree exhibits a complete, balanced crown structure with little to no deadwood and minimal defects as well as a properly formed root flare.
Fair	Represents a tree with minor health, balance or structural issues with minimal to moderate deadwood. Branching structure shows signs of included bark or minor rot within the branch connections or trunk wood. The root flare shows minimal signs of mechanical injury, decay, poor callusing, or girdling roots. Trees in the category require minor remedial actions to improve the vigour and structure of the tree.
Poor	Represents a tree that exhibits a poor vigour, reduced crown size (<30% of crown typical of species caused by overcrowding or decline), extreme crown unbalance, or extensive rot in the branching and trunk wood. Fungus could be seen from these rotting areas, suggesting further decay. These trees have extensive crown die back with a large amount of deadwood, and possibly dead sections. These weakened areas can lead to a potential failure of tree sections. Rooting zones show signs of extensive root decay or damage (fruiting bodies or mechanical damage) or girdling roots. Trees in this category require more extensive actions to prevent failure. A tree identified as poor would be a candidate for removal in the near future.
Very Poor	Represents a tree that exhibits major health and structural defects. Quite often the defects or diseases affecting this tree will be fatal. Large quantities of fungus, large dead sections with possible cavities and bark falling off all are signs that a tree is in a major state of decline and would be identified as very poor. These trees have a high potential for structural failure. These trees should be identified for removal.
<b>Potential for Structural Failure Rating*</b>	
Low	Trees that show good vigour and structure and show little to no signs of decline or structural issues.
Medium	Trees with some structural issues that are forming which could lead to failure if not addressed and properly treated (i.e. pruned). Symptoms of these structural issues include cavity openings/stem damage <30% of the circumference of the tree, poor branching union within the scaffold branches (signs of canker or decay within branch union), signs of historic branch failure throughout the crown, or advanced signs of included bark within the branch unions throughout the tree (water staining, tight angled branch unions, noticeable gap in branch union).
High	Trees with a large number of structural issues (i.e. poor branch union, decay) which could lead to the failure of large scaffold branches or major sections. Major defects include: large cavities within stem or branch wood, historic crown damage of the majority of the canopy, extensive lean due to recent or historic root damage/decay, or large dead crown limbs with fruiting bodies present. If trees identified as a High Potential for Structural Failure are located within striking distance of a target (high traffic place, person, or high value thing), the tree should be identified for removal as soon as possible.

<sup>1</sup>Dunster 2009

**APPENDIX III**      Conditions of Tree Assessment

**APPENDIX IV**      Tree Data Summary Tables



## Summary of Inventoried Trees

Common Name	Scientific Name	Excellent	Good	Fair	Poor	Very Poor	Dead	Total
<b>Native Species</b>								
American Basswood	<i>Tilia americana</i>			7	1			8
American Beech	<i>Fagus grandifolia</i>				2			2
Balsam Poplar	<i>Populus balsamifera</i>				1		1	2
Black Cherry	<i>Prunus serotina</i>		1					1
Black Walnut	<i>Juglans nigra</i>		1	2				3
Black Willow	<i>Salix nigra</i>				1			1
Butternut	<i>Juglans cinerea</i>			4	3		1	8
Eastern Cottonwood	<i>Populus deltoides</i>		2	4				6
Eastern Hemlock	<i>Tsuga canadensis</i>		3	4				7
Eastern White Cedar	<i>Thuja occidentalis</i>		4	5	2			11
Eastern White Pine	<i>Pinus strobus</i>		2	8	1		2	13
Freeman's Maple	<i>Acer X freemanii</i>			4				4
Green Ash	<i>Fraxinus pennsylvanica</i>			1				1
Hawthorn Species	<i>Crataegus sp.</i>			1				1
Honey Locust	<i>Gleditsia triacanthos</i>		2	1				3
Manitoba Maple	<i>Acer negundo</i>			1	2			3
Red Maple	<i>Acer rubrum</i>			4	1			5
Red Oak	<i>Quercus rubra</i>		2					2
Redbud	<i>Cercis canadensis</i>		1					1
Silver Maple	<i>Acer saccharinum</i>			1				1
Staghorn Sumac	<i>Rhus typhina</i>				1	1		2
Sugar Maple	<i>Acer saccharum ssp. saccharum</i>		1	4				5
Sycamore	<i>Platanus occidentalis</i>			1				1
Trembling Aspen	<i>Populus tremuloides</i>			1				1
White Ash	<i>Fraxinus americana</i>			1	1			2
White Birch	<i>Betula papyrifera</i>		1	3				4
White Elm	<i>Ulmus americana</i>					1	1	2
White Spruce	<i>Picea glauca</i>		1	18	7	1		27
Yellow Birch	<i>Betula alleghaniensis</i>			1	1			2
<b>Total</b>			21	76	24	3	5	129
<b>Non-Native Species</b>								
Austrian Pine	<i>Pinus nigra</i>			6	3	2		11
Black Locust	<i>Robinia pseudoacacia</i>			1	1			2
Butternut Hybrid	<i>Juglans X</i>		2		2			4
Cherry Species	<i>Prunus sp.</i>			1	1			2
Chinese Chestnut	<i>Castanea mollissima</i>			1	1			2
Colorado Spruce	<i>Picea pungens</i>		2	18	17	6	2	45
Common Lilac	<i>Syringa vulgaris</i>				1			1

Common Pear	<i>Pyrus communis</i>			1				1
Douglas Fir	<i>Pseudotsuga menziesii</i>			3				3
Dwarf Lilac	<i>Syringa pubescens</i>		1					1
English Yew	<i>Taxus baccata</i>	1	7	9	2			19
European Beech	<i>Fagus sylvatica</i>		3	3				6
European Larch	<i>Larix decidua</i>			1	3		1	5
European Spindle Tree	<i>Euonymus europaeus</i>			1				1
Ginkgo	<i>Ginkgo biloba</i>		2	1				3
Golden Weeping Willow	<i>Salix alba var. vitellina</i>				1			1
Horsechestnut	<i>Aesculus hippocastanum</i>		1	1				2
Japanese Maple	<i>Acer japonicum</i>		1					1
Norway Maple	<i>Acer platanoides</i>		3	22	1		2	28
Norway Spruce	<i>Picea abies</i>		2	25	10	1	1	39
Scots Pine	<i>Pinus sylvestris</i>			5	2	2	2	11
Serviceberry Species	<i>Amelanchier sp.</i>			3				3
Small Leaf Linden	<i>Tilia cordata</i>			1				1
White Mulberry	<i>Morus alba</i>		1	7	1			9
Yellow Cedar	<i>Chamaecyparis nootkatensis</i>			2				2
<b>Total</b>		<b>1</b>	<b>25</b>	<b>112</b>	<b>46</b>	<b>11</b>	<b>8</b>	<b>203</b>
<b>Overall Total</b>		<b>1</b>	<b>46</b>	<b>188</b>	<b>70</b>	<b>14</b>	<b>13</b>	<b>332</b>

### Overall Health of Trees Inventoried

Potential for Structural Failure Rating	Overall Health						Total
	Excellent	Good	Fair	Poor	Very Poor	Dead	
Low	1	45	36			3	85
Medium		1	152	24			177
High				46	14	10	70
<b>Total</b>	<b>1</b>	<b>46</b>	<b>188</b>	<b>70</b>	<b>14</b>	<b>13</b>	<b>332</b>