



Tree Inventory and Assessment Acton Branch Library Replacement Acton, Ontario

August 2009

Prepared For:
*Halton Hills Public Library
9 Church Street
Georgetown, Ontario
L7G 2A3*

Prepared By:
North-South Environmental Inc.
35 Crawford Crescent, Suite U5
P.O. Box 518
Campbellville, ON
L0P 1B0

Project Study Team

North – South Environmental Inc.

Mirek Sharp – Project Manager and Report Editor

Leah Lefler – Ecologist and Report Author

Christina Baranik – Field Assistant

Richard Czok – Geographic Information System Analyst



Table of Contents

1.0 Introduction..... 1
 1.1 Description of Subject Property..... 1
 1.2 Surrounding Land Use 1
 1.3 Purpose..... 1
2.0 Methods..... 1
3.0 Results..... 2
 3.1 Vegetation Community..... 2
 3.2 Tree Evaluation..... 2
4.0 Recommendations..... 6
 4.1 Tree Removal..... 6
 4.2 Tree Preservation 6
5.0 Conclusion 7
6.0 References..... 8

List of Tables

Table 1. Tree species identified within the study area.....5

List of Figures

Figure 1. Acton Library Tree Survey.....3

List of Appendices

Appendix 1: Tree Inventory Data Collection..... 9
Appendix 2: Tree Inventory..... 13
Appendix 3: Rarity Status Definitions..... 17



1.0 INTRODUCTION

North-South Environmental Inc. was retained by the Halton Hills Public Library to complete a tree inventory and assessment for the proposed replacement of the Acton Branch Library. Halton Hills Public Library has received Federal, Provincial and Municipal funding to rebuild the Library in Acton. The new Library will expand onto the property to the east of the current Library location; however, the exact location of the expansion has not yet been determined. As part of the preparation for the proposed development, a Tree Inventory and Assessment has been prepared within the scope of the expansion.

1.1 Description of Subject Property

The subject property is located at 17 River Street, Acton, Ontario. The proposed development will occur on the existing Town property. As previously mentioned, specifics of the proposed development are not currently available. The subject property, however, consists of the existing Library structure, a large mown lawn with scattered mature trees, a tributary of Black Creek, which passes through the southern portion of the site in roughly a northeast to southwest direction, and several flower gardens and footpaths.

1.2 Surrounding Land Use

The study area is bound by residential and commercial development in all directions. Fairy Lake, a human-made lake, lies approximately 1 km to the southwest of the subject property, downstream of the creek.

1.3 Purpose

The primary purpose of this report is to complete a tree inventory and assessment of tree health for Halton Hills Public Library. The tree survey was completed to identify, characterize and quantify the trees that could potentially be removed or affected due to the proposed development.

2.0 METHODS

One field visit was conducted on July 27th, 2009 to inventory the trees within the study area. The tree inventory was completed within the limits of the Library property (Figure 1). Trees around the perimeter of the property were not inventoried if they were either well outside the area considered for the potential development or were within the riparian corridor of the tributary that passes through the property, and would thus not be affected by the proposed development. Trees within the subject area were evaluated to provide information on the species, health, approximate age and location of individual trees which may impact decisions related to the location of development proposed at the site. The inventory also identified hazard trees, which should be removed from the site prior to the commencement of development to eliminate associated risks.

Tree data were recorded using a standard form (Appendix 1). The location of each tree was noted and recorded with a unique identification number to permit their matching with survey drawings and their inclusion on drawings. All trees greater than 10 cm in diameter at breast height (dbh, approximately 1.37 m above the ground) were included in the survey. All trees included within the survey were identified to species, dbh was recorded and the overall condition



of each tree was assessed by examining trunk integrity, crown structure and crown vigour. Once these three categories were assessed, the overall tree condition was determined using a ranking system from 1 to 5. Trees ranked 1 are in excellent condition while trees ranked 5 are in very poor condition. Specifically, the ranks are classified as follows:

1. Excellent – no visible symptoms;
2. Good – no apparent problems;
3. Fair – minor problems;
4. Poor – major problems; and
5. Very Poor – extreme problems.

See Appendix 2 for a detailed assessment of tree characteristics within each of the three categories listed above.

Tree inventory data were correlated with an existing survey, completed by Cunningham McConnell Limited, which provided precise tree locations and canopy widths within the subject property (Figure 1).

3.0 RESULTS

3.1 Vegetation Community

The study area consists of a mown lawn with scattered, predominantly non-native trees. The trees in this community are generally the same age (with the exception of a few younger trees that have been planted more recently), indicating that the majority of trees on the property were planted at roughly the same time. Tree height ranges between 10-25 m and total tree canopy cover is approximately 20%. The dominant tree at the subject property is Norway maple (*Acer platanoides*), followed by Norway spruce (*Picea abies*) and Scots pine (*Pinus sylvestris*). The occasional Manitoba maple (*Acer negundo*), European birch (*Betula pendula*) and eastern white cedar (*Thuja occidentalis*), among other species, are also located at the subject property. Given the low canopy cover, the relatively even age of the trees found on the subject property and ongoing maintenance of the lawn, a defined canopy and sub-canopy have not formed. The ground layer is sparse and consists almost entirely of mowed grass. The topography of the site generally slopes toward the watercourse in the southeast.

3.2 Tree Evaluation

A total of 38 trees were inventoried within the study area (Appendix 2). Of the 38 trees inventoried, ten different tree species were identified (Table 1). Five of the tree species are native to Ontario and are common in the area, which include Manitoba maple (*Acer negundo*), sugar maple (*Acer saccharum* ssp. *saccharum*), eastern white cedar (*Thuja occidentalis*), black walnut (*Juglans nigra*) and American basswood (*Tilia americana*). One species located at the site, black walnut, is restricted to the more southerly portions of southern Ontario in the Carolinian forest zone. Five of the tree species are non-native, which include Norway maple (*Acer platanoides*), European weeping birch (*Betula pendula*), Norway spruce (*Picea abies*), Scots pine (*Pinus sylvestris*) and crack willow (*Salix fragilis*). From a natural heritage perspective, native trees are more ecologically valuable. Although non-native tree species are important aesthetically, they provide little habitat function and contribute less to the larger



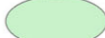









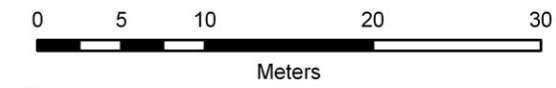
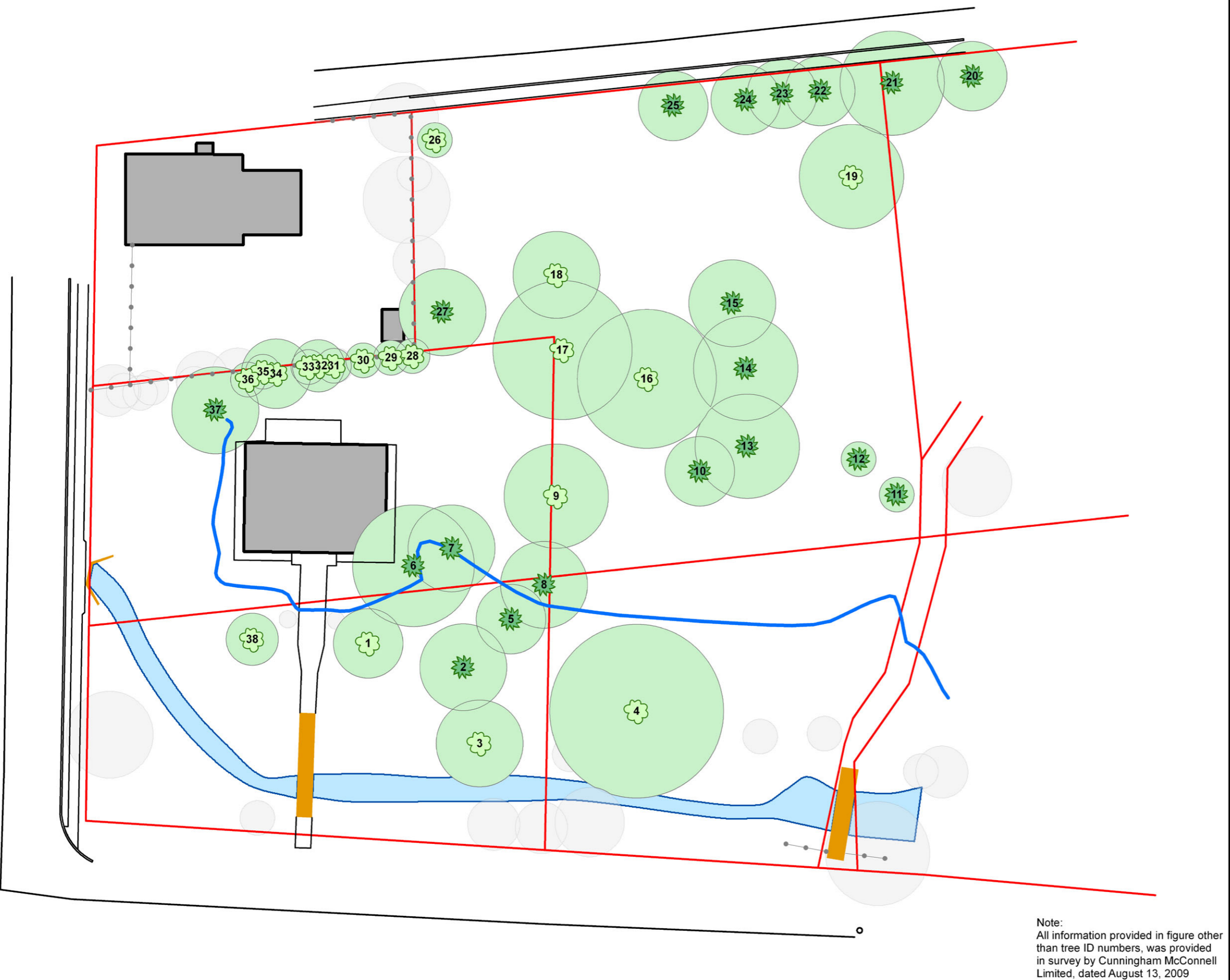
Acton Library Replacement Tree Survey

Figure 1

Legend

Tree Locations

-  Coniferous Trees
-  Deciduous Trees
-  Canopy - Surveyed Trees
-  Canopy - Other
-  Creek
-  Floodline
-  Fence
-  Bridge Locations
-  Buildings
-  Lot Lines



North-South Environmental Inc.
Specialists in Sustainable Landscape Planning



Note:
All information provided in figure other than tree ID numbers, was provided in survey by Cunningham McConnell Limited, dated August 13, 2009

ecosystem as a whole. Two of the species located at the subject property are considered to be aggressive invasive species (*i.e.*, Norway maple and Manitoba maple). These species are known to out-compete other native species in natural settings, thus decreasing native biodiversity.

The dominant tree species at the site are Norway maple (29%), Norway spruce (26%) and Scots pine (18%). The majority of trees were in either good or fair condition (*i.e.*, Classes 2 and 3). Four trees in poor condition, one tree in very poor condition and two dead trees were noted in the survey. These individuals should be assessed in terms of their hazard potential, particularly with respect to the proximity of the proposed development. The majority of trees are greater than 40 cm dbh (74%), indicating maturity.

Table 1. Tree species identified within the study area. Rarity status, G-Rank and S-Rank, are defined in detail in Appendix 3.

Scientific Name	Common Name	Native Status	Rarity Status	
			G Rank	S Rank
Aceraceae				
<i>Acer negundo</i> L.	Manitoba Maple	native	G5	S5
<i>Acer platanoides</i> L.	Norway Maple	non-native	G?	SE5
<i>Acer saccharum</i> Marshall ssp. <i>saccharum</i>	Sugar Maple	native	G5T5	S5
Betulaceae				
<i>Betula pendula</i> Roth	European Weeping Birch	non-native	G?	SNA
Cupressaceae				
<i>Thuja occidentalis</i> L.	Eastern White Cedar	native	G5	S5
Juglandaceae				
<i>Juglans nigra</i> L.	Black Walnut	native	G5	S4
Pinaceae				
<i>Picea abies</i> (L.) Karsten	Norway Spruce	non-native	G5	SNA
<i>Pinus sylvestris</i> L.	Scots Pine	non-native	G?	SNA
Salicaceae				
<i>Salix fragilis</i> L.	Crack Willow	non-native	G?	SNA
Tiliaceae				
<i>Tilia americana</i>	American Basswood	native	G5	S5



The condition of trees on the site varied, however over half of the trees (77%) were identified as in fair to good condition. The breakdown of tree condition is as follows:

- 2 trees are dead (4%);
- 1 tree is in very poor condition (3%);
- 4 trees are in poor condition (11%);
- 12 trees are in fair condition (32%);
- 17 trees are in good condition (45%); and
- 2 trees are in excellent condition (5%).

Trees numbered 29 and 34 are dead and have been identified as hazard trees. Both of these trees are defoliated and appear to have been dead for some time. Trees 12 and 27 showed evidence of insect borer activity, however, these trees currently remain in relatively good health. Many of the larger Scots pine and Norway spruce have broken tops, most likely due to wind damage (*i.e.*, trees 5, 6, 8, 15, 25, and 27). Although the canopy structure of these trees has been altered, their health largely remains intact. It is noteworthy that Scots pine are susceptible to blowdowns when maturity is reached. Given the unpredictable nature of the stability of these trees, it may be prudent to consider their removal when identifying hazard trees.

4.0 RECOMMENDATIONS

4.1 Tree Removal

Prior to the commencement of construction, it is recommended that all trees identified as hazards be removed from the study area. Depending on the location of the proposed development, further tree removal will most likely be necessary, due to the location of the new library building envelope and the potential need for grade changes. Trees are typically recommended for removal in areas where grade changes exceed ± 0.5 m due to the exposure or smothering of root systems. Trees undergoing less than a ± 0.5 m grade change may be retained if in a healthy condition, but may require special attention such as the creation of a well around the base of the trunk to minimize impacts to root systems. Further investigation into tree preservation can be undertaken once a site plan and grading plan are available. These plans will facilitate identification of trees that will need to be removed and those that can be preserved.

4.2 Tree Preservation

Prior to the removal of trees and expansion of the Acton Branch Library, it is recommended that an erosion control fence be installed along the perimeter of the construction area, particularly along the edge of the watercourse. This fence will serve to mitigate the movement of sediment and clearly delineate the area required to minimize damage to root zones during construction. During construction, machinery and materials should not be used or stored in the area within the fencing. Storage of machinery or materials under a tree canopy compacts the soil which, in turn, decreases the amount of oxygen, water, and nutrients available to tree roots, while also posing the potential risk of physically damaging the tree.



5.0 CONCLUSION

The proposed expansion of the Acton Library will inevitably require the removal of trees. Given the outcome of the survey, the majority of these trees will be non-native, mature and, for the most part, in fair condition. Two definite hazard trees have been identified, along with several potentially hazardous trees. In-depth study of these hazards should be fully explored as part of a tree preservation plan to be prepared prior to the commencement of construction.

Given the cultural (*i.e.*, not natural) nature of the site, it is unlikely that the study area provides supporting habitat to wildlife species. This is largely due to the fact that the area is manicured and would not provide much cover for fauna. Therefore, the proposed development should not result in the loss of habitat or compromise habitat in any nearby natural features. Rather, the loss will most likely be limited to the loss of individual trees and the benefits they provide in terms of aesthetics, urban tree canopy, climate amelioration, *etc.* Mitigating the loss of trees through the planting of native tree species around the new library facility should also be considered in the tree preservation plan.



6.0 REFERENCES

Natural Heritage Information Centre (NHIC). 2009. Available online: <http://nhic.mnr.gov.on.ca/>



APPENDIX 1: TREE INVENTORY DATA COLLECTION



Appendix 1. Tree Inventory Data Collection

Tree Species:

Common name & scientific binomial (genus, species)

Tree Size:

Diameter at breast height (DBH)

Trunk Integrity:

r	root damage or decay
st	split stem/weak crotch
br	butt rot
l	excessive lean (e.g. 30° to 45°)
h	upper stem holes/decay
w	wound (bark damage, large pruning cuts)
f	fungus (conks)
ib	insect borers
b	burl
wh	woodpecker holes
s	seam or cracks
c	cankers

Crown Structure:

bt	broken top
bl	broken or severed primary limbs
p	pollarded (severe and improper pruning)
ab	adventitious branching (clusters of new shoots on main trunk)

Crown Vigour:

dl	moderate dead wood (e.g. 11 to 35% secondary branches mostly)
d	significant crown dieback (e.g. >35% dead wood in primary limbs)
u	undersized leaves
fc	foliar chlorosis/yellowing
fn	foliar necrosis/browning
id	insect defoliators (species if known)
di	disease (species if known)

Tree Vigour Classes:

Class 1 Excellent Condition, No Risk Trees

Sound, thrifty, full crowned trees of natural shape with no dead limbs in the top of the crown and no significant evidence of decline.

Class 2 Good Condition, Low Risk Trees

Full to medium crowned trees of natural shape with a live crown ratio $\geq 40\%$ that exhibit no more than minor dead wood (e.g. up to 10% secondary branches only and mainly in the lower crown) and no more than one moderate trunk defect or indicator of decline.



Class 3 Fair Condition, Medium Risk Trees

Full to small crowned trees with a live crown ratio $\geq 25\%$ that exhibit no more than moderate dead wood (e.g. 11 to 35% secondary branches mostly) and no more than two moderate trunk defects or indicators of decline.

Class 4 Poor Condition, High Risk Trees

Medium to very small crowned trees (e.g. live crown ratio $< 25\%$) that exhibit one or more of the following conditions.

- a) Trees with significant foliage of poor colour and less than normal size.
- b) Trees with significant crown dieback (e.g. $> 35\%$ dead wood in primary limbs).
- c) Trees with major trunk defects or decay (e.g. one extensive problem, or 3 or more distinct but moderate decline indicators).

Class 5 Very Poor Condition, Very High Risk Trees

Dying trees with very little live crown.

Class 6 Dead Tree

No live foliage present



APPENDIX 2: TREE INVENTORY



Appendix 2. Detailed description of trees inventoried within the study area.

Tree #	Scientific Name	Common Name	Native Status	DBH (cm)	Condition	Class	Comments
1	<i>Betula pendula</i>	European birch	non-native	56.1	st, s, dl	3	3 stems; flowerbed
2	<i>Picea abies</i>	Norway spruce	non-native	74.2	dl	2	mature
3	<i>Tilia americana</i>	American basswood	native	142.9	st, c, dl, bl	4	11 stems; creek corridor
4	<i>Salix fragilis</i>	Crack willow	non-native	109.5	dl, bl, st, b	3	st above dbh; ck corridor
5	<i>Pinus sylvestris</i>	Scots pine	non-native	68.8	bt, st, dl	3	mature
6	<i>Pinus sylvestris</i>	Scots pine	non-native	62.1	bt, dl, p	3	mature; slight lean
7	<i>Pinus sylvestris</i>	Scots pine	non-native	68.1	p, dl, bl	3	bark peeled; twisted trunk
8	<i>Pinus sylvestris</i>	Scots pine	non-native	59.8	bt, dl, bl	4	mature; small crown
9	<i>Acer platanoides</i>	Norway maple	non-native	45.7	dl	2	
10	<i>Picea abies</i>	Norway spruce	non-native	45.4	dl	2	
11	<i>Thuja occidentalis</i>	Eastern white cedar	native	42.7	s	2	slight lean
12	<i>Thuja occidentalis</i>	Eastern white cedar	native	44.1	st, ib, bl	3	slight lean
13	<i>Picea abies</i>	Norway spruce	non-native	63.6	dl, bl	2	mature
14	<i>Pinus sylvestris</i>	Scots pine	non-native	69.3	s, bl, dl	3	long seam
15	<i>Pinus sylvestris</i>	Scots pine	non-native	62.8	dl, bt, bl	3	mature
16	<i>Acer platanoides</i>	Norway maple	non-native	57.1	dl, s, bl	3	mature
17	<i>Acer saccharum</i>	Sugar maple	native	92.5	s, dl, bl	2	mature
18	<i>Acer platanoides</i>	Norway maple	non-native	44.3	dl, bl, c	3	mature; crooked top
19	<i>Acer platanoides</i>	Norway maple	non-native	64.1	st, c, s, dl	4	mature; two cankers
20	<i>Picea abies</i>	Norway spruce	non-native	57.7	dl, bl	2	mature
21	<i>Picea abies</i>	Norway spruce	non-native	73.9	dl, bl	2	mature
22	<i>Picea abies</i>	Norway spruce	non-native	48.0	bl, dl	2	mature
23	<i>Picea abies</i>	Norway spruce	non-native	51.6	bl	2	mature
24	<i>Picea abies</i>	Norway spruce	non-native	59.2	bl	2	mature
25	<i>Picea abies</i>	Norway spruce	non-native	63.5	dl, bl, bt, p	5	top missing
26	<i>Acer platanoides</i>	Norway maple	non-native	19.9		1	black spots on leaves
27	<i>Pinus sylvestris</i>	Scots pine	non-native	58.8	bt, bl, dl, ib, c	4	tree sap discharging
28	<i>Acer negundo</i>	Manitoba maple	native	11.6	l	2	leaning over fence
29	<i>Acer platanoides</i>	Norway maple	non-native	17.5	f, dl, bl, d	6	dead
30	<i>Acer platanoides</i>	Norway maple	non-native	10.8		1	
31	<i>Acer platanoides</i>	Norway maple	non-native	46.3	dl, st	3	



Tree #	Scientific Name	Common Name	Native Status	DBH (cm)	Condition	Class	Comments
32	<i>Acer platanoides</i>	Norway maple	non-native	10.7	dl	2	
33	<i>Acer platanoides</i>	Norway maple	non-native	31.7	l	2	
34	<i>Juglans nigra</i>	Black walnut	native	13.4		6	dead
35	<i>Acer negundo</i>	Manitoba maple	native	39.5	st, dl	2	
36	<i>Acer platanoides</i>	Norway maple	non-native	28.1	dl	2	
37	<i>Picea abies</i>	Norway spruce	non-native	58.4	bl, dl	3	slight lean
38	<i>Betula pendula</i>	European birch	non-native	21.8	dl	2	flowerbed



APPENDIX 3: RARITY STATUS DEFINITIONS



Appendix 3. Rarity Status Definitions.

Global Rarity (G_Rank)

Global ranks are assigned by a consensus of the network of conservation data centres, scientific experts, and The Nature Conservancy to designate a rarity rank based on the range-wide status of a species, subspecies or variety. This ranking system ranges from G1 to G5; with G1 being extremely rare and G5 being common.

Provincial Rank (S_RANK)

Provincial ranks are used by the NHIC to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario. The NHIC evaluates provincial ranks on a continual basis and produces updated lists at least annually. The ranking system ranges from S1 to S5; with S1 being critically imperilled and S5 being secure. SNA stands for not applicable, which applies when a conservation status rank is not applicable because the species is not a suitable target for conservation activities.

