Combined Environmental Impact Statement & Tree Conservation Report
Kanata Golf and Country Club Redevelopment
7000 Campeau Drive, Ottawa

August 2019

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LIST OF FIGURES

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EXECUTIVE SUMMARY

McKinley Environmental Solutions (MES) and Muncaster Environmental Planning (MEP) were retained by Minto Communities on behalf of Clublink Corporation ULC to prepare a Combined Environmental Impact Statement (EIS) and Tree Conservation Report (TCR) to support the proposed redevelopment of the Kanata Golf and Country Club property (the Site). Clublink, in partnership with Minto Communities and Richcraft Homes, proposes to redevelop the Site to accommodate a residential subdivision. The Site occurs within the developed urban portion of Kanata (Ottawa) and is predominantly surrounded by existing developed residential homes and/or roads on all sides. There are no significant natural heritage features located within or adjacent to the Site. The Site is approximately 71 ha in size and is irregularly shaped.

The Site has been operated as a golf and country club for several decades and is predominantly an artificial landscape which has been maintained to provide golfing facilities. The Site includes four (4) existing buildings. The majority of the surface area of the Site includes manicured golf greens and fairways (e.g. manicured lawns). The Site also includes a variety of native and non-native landscaping features, including many deciduous and coniferous planted trees and tree stands. Natural vegetation communities primarily consist of patches of native deciduous forest and deciduous thickets, which are present principally around the edges of the Site. There are five (5) forest patches that are ≥0.8 ha in size, with the largest being approximately 1.59 ha. Of these, only three (3) appear to have significant forest cover that is ≥60 years of age. Therefore, there are three (3) forest patches which qualify as potential Significant Woodlots under the amended City of Ottawa criteria for the urban area.

There are no natural watercourses or wetland habitats within the Site. Two (2) stormwater management ponds are located within the Site. Six (6) stormwater conveyance/infiltration swales are also present within the Site, all of which are fed either by outlet pipes from the adjacent developed subdivisions or by surface run-off from the golf greens. Although small patches of wetland vegetation have developed within some of the stormwater swales, none of these are natural features, and none are large enough to qualify as wetlands.

Lastly, Butternut Trees (endangered) were noted within the Site. A Butternut Health Assessment (BHA) has been completed to assess the condition of the Butternut Trees. Regulatory requirements related to impacts to the Butternut Trees and their habitat will be addressed as required by the Ontario Endangered Species Act. No other significant Species at Risk (SAR) concerns were noted for the Site.

The Site is proposed to be redeveloped to include approximately 545 single detached homes, 586 townhomes, and 371 medium density units for a total of approximately 1,502 units. The two (2) existing stormwater management ponds and the existing stormwater management swales are to be decommissioned. Stormwater servicing will be provided by five (5) new stormwater management blocks, which collectively will occupy approximately 8.02 ha. The Site will also receive municipal sewer and water.

Three (3) major park blocks are identified which collectively provide 4.36 ha of parkland. Notably, park block 75 overlaps a portion of potential Significant Woodlot D, thereby providing an opportunity for portions of the feature and its significant functions to be retained. The Land Use Concept Plan includes an additional 5.36 ha of open space blocks, which will provide additional opportunities for tree retention. Notably, open space block 87 will preserve a portion of potential Significant Woodlot C, whereas open space blocks 88 and 91 will preserve a portion of potential Significant Woodlot E. Lastly, the Land Use Concept Plan includes 3 m wide landscaped buffers around the Site edges adjacent to existing residential properties. The combined size of the 3 m wide landscaped buffers is 1.7 ha. Many of the Site edges are currently occupied by planted trees, tree stands, or forest patches, and therefore the 3 m wide landscaped buffers will provide additional opportunities for tree retention along the Site edges, including protection of the critical root zones. A network of trails has been identified to connect the parkland, open space blocks, and stormwater management blocks. In total, the parkland, open space blocks, 3 m wide landscaped property buffers, and stormwater management blocks account for approximately 27% of the gross area of the Site. Collectively, these communal open space areas will provide opportunities for tree retention and tree planting, while also preserving the recreational and aesthetic values of the Site. Notably, the combination of park and open space blocks provides opportunities to preserve the significant features and functions of the three (3) potential Significant Woodlots.

Provided that the regulatory, mitigation, and avoidance measures outlined in this report are implemented appropriately, the redevelopment is not anticipated to have a significant negative effect on the natural features and functions.

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1.0 INTRODUCTION

1.1 Reading the Tree Conservation Report (TCR)

This report is presented as a Combined Environmental Impact Statement (EIS) and Tree Conservation Report (TCR). Readers who are principally interested in the TCR may choose to read only those portions of the report where the section headings are marked **(TCR)**. This includes Sections 1.3, 1.4, 1.6, 2.0.1, 2.0.2, 3.2, 3.3, 3.7.3, 4.1, 4.4.1, and Appendix D. Readers who are interested in the EIS should read the entire report, as information included in the TCR sections is not reiterated.

1.2 Scoping the Environmental Impact Statement

This EIS was undertaken following the City of Ottawa's Environmental Impact Statement Guidelines. Following the City guidelines, the Environmental Impact Statement (EIS) includes the following:

- Documentation of existing natural features on and around the Site;
- Identification of potential environmental impacts of the project;
- Recommendations for ways to avoid and reduce any negative impacts; and
- Proposal of ways to enhance natural features and functions.

This EIS was prepared with guidance from the *Natural Heritage Reference Manual* (OMNRF 2010). The major objective of this EIS is to assess whether the proposed project will negatively affect the significant features and functions of the Site, and to ensure that impacts will be minimized through mitigation measures.

1.3 Site Overview and Background (TCR)

The Site addressed by this Combined EIS and TCR encompasses the Kanata Golf and Country Club property, which is proposed to be redeveloped jointly by Minto Communities, Richcraft Homes and Clublink, in order to accommodate a residential subdivision (discussed below). The Site is approximately 71 ha in size and is irregularly shaped. The municipal address of the Site is 7000 Campeau Drive. The Site occurs within the developed urban portion of Kanata (Ottawa) and is predominantly surrounded by existing developed residential homes and/or roads on all sides. There are no significant natural heritage features located within or adjacent to the Site.

The Site has been operated as a golf and country club for several decades and is predominantly an artificial landscape which has been maintained to provide golfing facilities. The Site includes four (4) existing buildings. These include two (2) vehicle maintenance/workshop buildings, the clubhouse/restaurant, and a small storage shed. The majority of the surface area of the Site includes manicured golf greens and fairways (e.g. manicured lawns). The Site also includes a variety of native and non-native landscaping features, including many deciduous and coniferous planted trees and tree stands. Natural vegetation communities primarily consist of patches of native deciduous forest and deciduous thickets, which are present principally around the edges of the Site. There are five (5) forest patches that are ≥0.8 ha in size, with the largest being approximately 1.59 ha. Of these, only three (3) appear to have significant forest cover that is ≥60 years of age. Therefore, there are three (3) forest patches which qualify as potential Significant Woodlots under the amended City of Ottawa criteria for the urban area (discussed in greater detail in Section 3.3).

There are no natural watercourses or wetland habitats within the Site. Two (2) Stormwater Management (SWM) ponds are located within the Site (referred to as the Northern and Southern SWM Ponds). Six (6) stormwater conveyance/infiltration swales are also present within the Site, all of which are fed either by outlet pipes from the adjacent developed subdivisions or by surface run-off from the golf greens. Although small patches of wetland vegetation have developed within some of the stormwater swales, none of these are natural features, and none are large enough to qualify as wetlands.

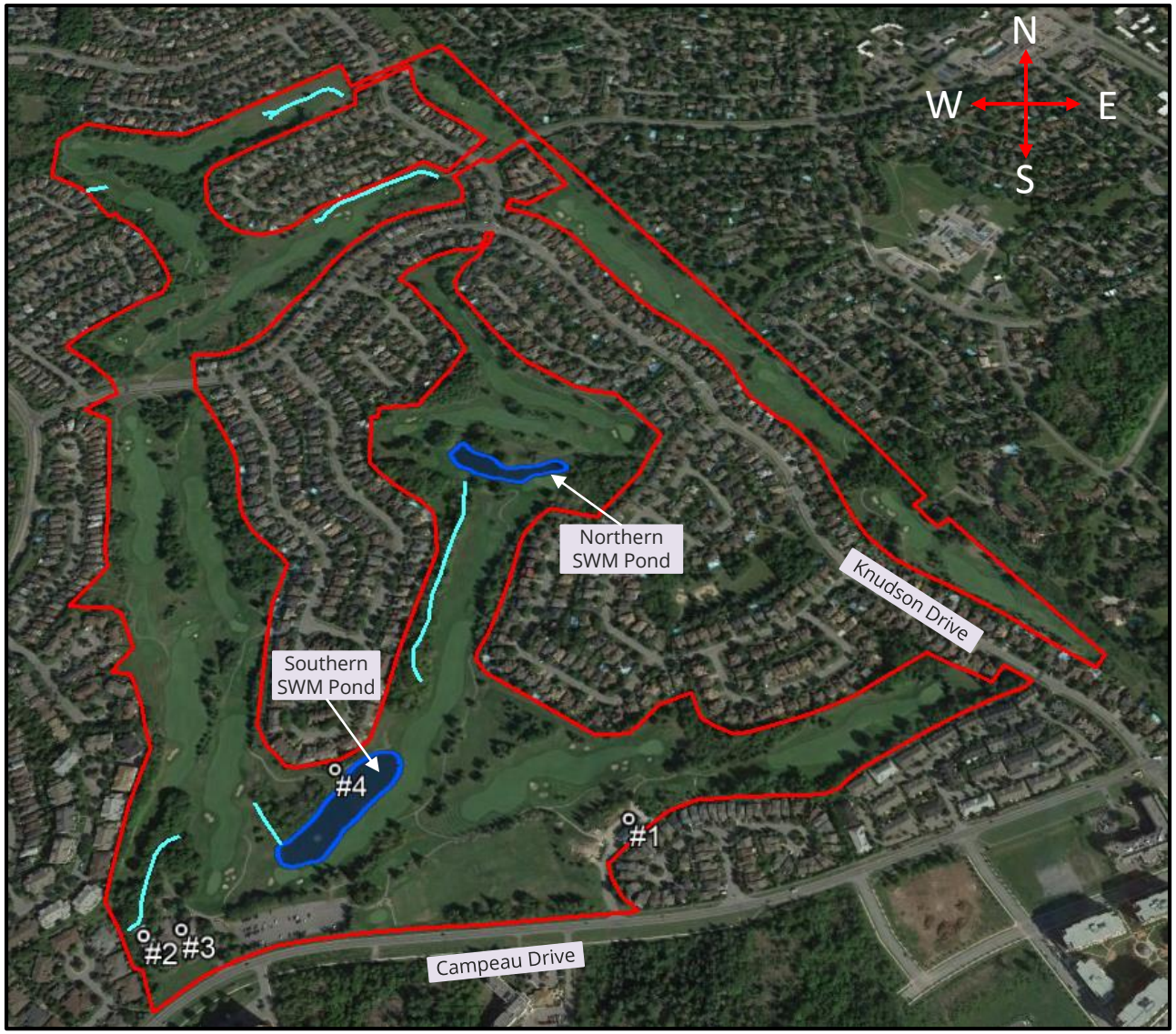
Lastly, Butternut Trees (endangered) were noted within the Site. As discussed in Sections 1.6 and 3.7.3, a Butternut Health Assessment (BHA) has been completed to assess the condition of the Butternut Trees (Appendix F). Regulatory requirements under the Ontario Endangered Species Act to address impacts to Butternut Trees and their habitat are discussed below in Section 1.6. No other significant Species at Risk (SAR) concerns were noted for the Site.

McKINLEY ENVIRONMENTAL SOLUTIONS

FIGURE 1: SITE OVERVIEW

Kanata Golf and Country Club Redevelopment

Combined Environmental Impact Statement and Tree Conservation Report



- Site Limits
- Stormwater Infiltration Swales
- #1 - Existing Buildings

Please Note: This is not a legal land survey. All dimensions and locations are shown as approximate.

1.4 Description of Undertaking (TCR)

The Land Use Concept Plan and the Draft Plan of Subdivision are included below. As noted above, the Site as a whole is approximately 71 ha in size. The Site is proposed to be redeveloped to include approximately 545 single detached homes, 586 townhomes, and 371 medium density units for a total of approximately 1,502 units. The two (2) existing stormwater management ponds and the existing stormwater management swales are to be decommissioned. Stormwater servicing will be provided by five (5) new stormwater management blocks, which collectively will occupy approximately 8.02 ha. The Site will also receive municipal sewer and water.

Three (3) major park blocks are identified which collectively provide 4.36 ha of parkland. Notably, park block 75 overlaps a portion of potential Significant Woodlot D, thereby providing an opportunity for portions of the feature and its significant functions to be retained. The Land Use Concept Plan includes an additional 5.36 ha of open space blocks, which will provide additional opportunities for tree retention. Notably, open space block 87 will preserve a portion of potential Significant Woodlot C, whereas open space blocks 88 and 91 will preserve a portion of potential Significant Woodlot E. Lastly, the Land Use Concept Plan includes 3 m wide landscaped buffers around the Site edges adjacent to existing residential properties. The combined size of the 3 m wide landscaped buffers is 1.7 ha. Many of the Site edges are currently occupied by planted trees, tree stands, or forest patches, and therefore the 3 m wide landscaped buffers will provide additional opportunities for tree retention along the Site edges, including protection of the critical root zones. A network of trails has been identified to connect the parkland, open space blocks, and stormwater management blocks. In total, the parkland, open space blocks, 3 m wide landscaped property buffers, and stormwater management blocks account for approximately 27% of the gross area of the Site. Collectively, these communal open space areas will provide opportunities for tree retention and tree planting, while also preserving the recreational and aesthetic values of the Site. Notably, the combination of park and open space blocks provides opportunities to preserve the significant features and functions of the three (3) potential Significant Woodlots. Tree retention is discussed in greater detail in Section 4.1.

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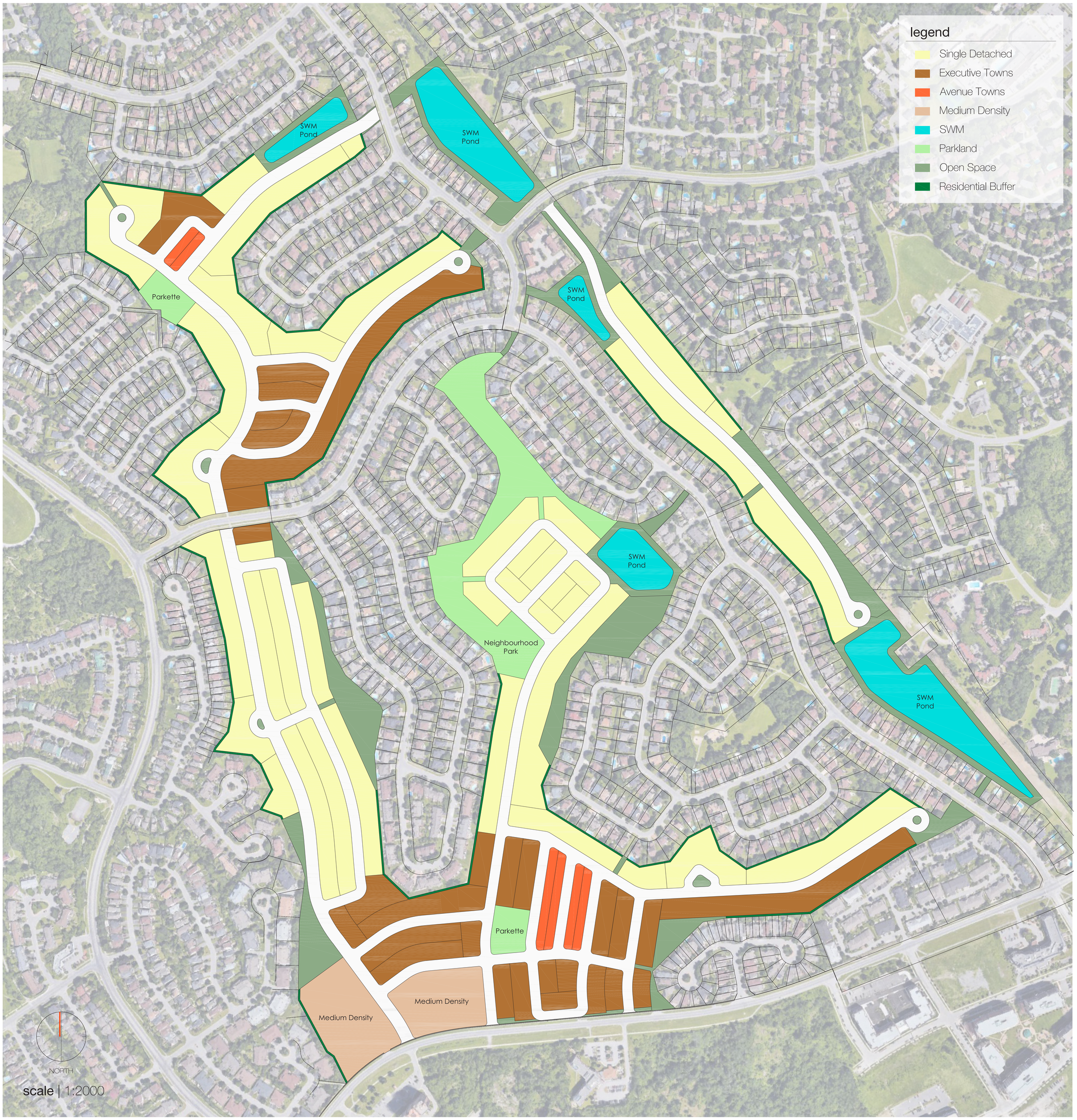

concept stats

Concept Plan V8.0

Frontage

Product Type	Length (m)	%
Single Detached	6355.13	60.8%
Executive Towns	3408.70	32.6%
Avenue Towns	696.83	6.7%
Total	**10460.66**	**100.0%**

Road Length

Road Type	Length (m)	%
13.25m Local	197.48	2.5%
14.50m Local	49.31	0.6%
16.50m Local	5965.63	75.1%
20.00m Collector	1735.80	21.8%
Total	**7948.22**	**100.0%**

Area Summary

Area Type	Area (ha.)	Area (ac.)	%
Single Detached	22.76	56.25	32.1%
Executive Towns	11.05	27.30	15.6%
Avenue Towns	1.02	2.52	1.4%
Medium Density	2.97	7.34	4.2%
Roads	13.65	33.73	19.3%
Total Net Net Area	**51.45**	**127.13**	**72.6%**
Parkland	4.36	10.77	6.2%
Open Space	5.36	13.24	7.6%
Pond	8.02	19.82	11.3%
Residential Buffer(1)	1.70	4.20	2.4%
Subtotal Green Space Area	**19.44**	**48.04**	**27.4%**
Total Gross Area	**70.89**	**175.17**	**100.0%**

(1) Plan utilizes a 3m buffer where adjacent to existing residential property.

Unit Count

Product Type	Unit Width & UPH	Units	%	% By Product	Product Type
Single Detached	11.7	545	36.3%	36.3%	Singles
Executive Towns	6.5	498	33.2%	39.0%	Towns
Avenue Towns	7.5	88	5.9%		
Medium Density (4)	125	371	24.7%	24.7%	Condo
Total		**1502**	**100.0%**	**100.0%**	

(1) Average Single Detached width (11.7m) is based on Minto products 30'/36'/43'.
(2) Average Executive Townhome width (6.5m) is based on Minto TH products.
(3) Average Avenue Townhome width (7.5m) is based on Minto products.
(4) Based on a density of 125 units/ha.

Parkland Area Comparison

Scenarios	Area (ha.)	Area (ac.)	%
Current Plan*	19.44	48.04	27.4%
Minimum 5% Requirement**	3.54	8.76	5.0%
1ha/300unit target***	5.01	12.37	7.1%
40% Agreement	28.36	70.07	40.0%

Based on **Subtotal Park Area as noted above*
***Based on **Total Gross Area** as noted above*
****Based on **Total Unit Count** as noted above*

minto Communities

NAK design strategies

MINTO | PROJECT FORE

land use concept plan

Version 8.1

date | 7 may 2019

SUBJECT TO THE CONDITIONS, IF ANY, SET FORTH IN OUR LETTER DATED _____ 20____.
THIS DRAFT PLAN IS APPROVED BY THE CITY OF OTTAWA UNDER SECTION 51 OF THE PLANNING ACT.
THIS_____DAY OF_____20_____.

DERRICK MOODIE, MANAGER
DEVELOPMENT REVIEW: WEST
PLANNING, INFRASTRUCTURE AND ECONOMIC DEVELOPMENT DEPARTMENT, CITY OF OTTAWA

KEY PLAN
NTS / SCALE

DRAFT PLAN OF SUBDIVISION OF

BLOCK 69
REGISTERED PLAN 4M-510,
BLOCKS 126 AND 132
REGISTERED PLAN 4M-651,
PART OF BLOCKS 184 AND 192,
ALL OF BLOCKS 183, 185 AND 186
REGISTERED PLAN 4M-652,
BLOCK 160
REGISTERED PLAN 4M-739,
BLOCK 76
REGISTERED PLAN 4M-741,
PART OF BLOCK 76
REGISTERED PLAN 4M-828,
PART OF BLOCK 1
REGISTERED PLAN 4M-881,
PART OF BLOCK 56 AND
ALL OF BLOCK 55
REGISTERED PLAN 4M-883,
PART OF LOTS 5 AND 6 AND
PART OF THE ROAD ALLOWANCE
BETWEEN LOTS 5 AND 6
(CLOSED BY BY-LAW. INST. LT552228)
CONCESSION 3
(GEOGRAPHIC TOWNSHIP OF MARCH)
CITY OF OTTAWA

Scale 1:1500
0 5 10 20 30 40 50 METRES

METRIC CONVERSION
DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

BEARING NOTE
BEARINGS ARE COMPILED FROM OFFICE RECORDS.

LEGEND:

#	DENOTES	PIN BLOCK 04511
*	-	PIN BLOCK 04512
**	-	PIN BLOCK 04513
DA	-	ZONING

INFORMATION: REQUIRED UNDER SECTION 51 (17) OF THE PLANNING ACT R.S.O. 1990

a. SEE PLAN
b. SEE PLAN
c. SEE PLAN
d. SEE PROPOSED LAND USE SCHEDULE (ABOVE)
e. SEE PLAN
f. SEE PLAN
g. SEE PLAN
h. CITY WATER AVAILABLE
i. SEE SOIL REPORT
j. SEE TOPOGRAPHICAL INFORMATION
k. ALL CITY SERVICES AVAILABLE
l. SUBJECT TO EASEMENTS PER INST. NO.'S LT507362, LT568249, LT569068, LT638339, LT568246, LT568250, LT568251, LT606272, LT1014950, LT607253, LT568247, LT1365034, LT599218, LT599219, LT1011768, LT686335, LT924341, MB1493, TOGETHER WITH LT1022019S

SURVEYOR'S CERTIFICATE
I HEREBY CERTIFY THAT THE BOUNDARIES OF THE SUBJECT LANDS AND THEIR RELATIONSHIP TO ADJOINING LANDS HAVE BEEN ACCURATELY AND CORRECTLY SHOWN.

DATE

BRIAN J. WEBSTER
ONTARIO LAND SURVEYOR

NOTE:
THIS PLAN DATA IS COMPILED FROM OFFICE RECORDS OF STANTEC GEOMATICS LTD. AND HAS NOT BEEN VERIFIED BY FIELD MEASUREMENTS. ALL DISTANCES ARE APPROXIMATE. TO BE VERIFIED BY FINAL REGISTERED PLAN(S).

Stantec Geomatics Ltd.
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ONTARIO LAND SURVEYORS
1331 CLYDE AVENUE, SUITE 400
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TEL 613.722.4420 FAX 613.722.2799
STANTEC.COM

DRAWN: CBC | CHECKED: * | PM: FP | FIELD: * | PROJECT NO.: 161612944-131

1.5 Agency Consultation

The proponent has discussed the current redevelopment proposal with the City, and the Mississippi Valley Conservation Authority (MVCA) will be circulated as part of the development application review. The Ontario Ministry of Natural Resources and Forestry (OMNRF) provided a potential Species at Risk (SAR) list for the Geographic Township of March (Appendix E). Responsibility for the administration of the Ontario Endangered Species Act (ESA) has recently been transitioned from the OMNRF to the Ontario Ministry of Environment, Climate Change, and Parks (OMECP). As noted below, it is anticipated that additional review/consultation with the OMECP will be required to address requirements under the Ontario ESA with respect to the presence of Butternut Trees (endangered).

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1.6 Regulatory Requirements (TCR)

As discussed in greater detail in the following sections, the following natural heritage related approvals are anticipated to be required:

- **Ontario Endangered Species Act (ESA):** Butternut Trees (endangered) were noted within the Site. The rules and regulations of the Ontario Endangered Species Act (ESA) require the completion of a Butternut Health Assessment (BHA) in order to assess the health status of the Butternut Trees and subsequent regulatory requirements under the Ontario ESA (OMECP 2019). The BHA was completed in June 2019 (Appendix F). Due to the presence of Category 3 trees, it is anticipated that the redevelopment will require authorization through obtainment of an Overall Benefit Permit under Clause 17(2)(C) of the Ontario ESA. The Ontario ESA permitting process will be initiated prior to obtainment of Draft Approval. No other significant Species at Risk (SAR) issues were identified for the Site.
- **Ontario Regulation 153/06:** Ontario Regulation 153/06 regulates activities that would alter shorelines, watercourses, and wetlands. As discussed below, there are no natural watercourses and/or wetlands present within the Site or in the immediately surrounding area. The two (2) existing stormwater management ponds and the stormwater management swales are artificial features that are entirely fed by outlet pipes from the surrounding subdivisions and overland flow from the golf course. There is no upstream or downstream connection to natural watercourses or wetlands. As such, a Headwaters Drainage Assessment (HDA) is not anticipated to be required to support the MVCA project review.
- **Fisheries Act:** Fisheries and Oceans Canada does not require projects that take place within artificial stormwater management ponds to be submitted for review under the Fisheries Act (FOC 2019). Therefore, a review under the Fisheries Act is not required to support the decommissioning of the existing stormwater management ponds and swales. Fish and wildlife salvage requirements during dewatering are discussed in Section 4.4.3.
- **Tree Removal Permit:** The City of Ottawa will require obtainment of a Tree Removal Permit under the Urban Tree Conservation By-law No. 2009-200 prior to the commencement of tree clearing.

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2.0 METHODOLOGY

2.0.1 Vegetation Survey and Tree Inventory Methodology (TCR)

A three (3) season plant inventory was undertaken to document the occurrence of plants, create a master plant list, and to identify and delineate plant communities. Site visits to inventory plants and measure tree sizes were completed by Dr. McKinley on May 8th, May 24th, June 2nd, June 13th, and September 17th 2018.

The majority of the surface area of the Site includes manicured golf greens and fairways (e.g. manicured lawns). The Site also includes a variety of native and non-native landscaping features, including many deciduous and coniferous trees and tree stands. Natural vegetation communities primarily consist of patches of native deciduous forest and deciduous thickets, which are present principally around the edges of the Site. Because the Site includes a mixture of natural forest/thickets, landscaping features, and many small tree stands, several survey methods were employed.

Forest patches and thickets were classified according to the vegetation communities identified in the Ecological Land Classification (ELC) manual (OMNRF 1998; Lee 2008). Tree measurements were completed in areas of continuous tree and shrub cover by undertaking TCR sampling plots. Plots were measured 5 m by 10 m to give a total survey area of 50 m^2 (for each plot). Plots were distributed evenly within the forested portions of the Site to achieve the desired density of 1 plot per hectare of forest (minimum). A total of twenty one (21) plots were undertaken throughout the forested areas of the Site. The number of plots undertaken in each vegetation community is listed below in Tables A & B (Section 3.2). Trees within each plot that were 10 cm diameter at breast height (dbh) or greater in size were measured with the use of a D-tape, which is a calibrated dbh tape.

In addition to the forest and thicket communities, the Site includes a comparatively large number of native and non-native landscaping features, including both deciduous and coniferous stems. For the purposes of this Combined EIS and TCR, landscaping features, individual trees, and tree stands were surveyed and are described in detail where stands of trees occur with approximately ten (10) or more stems and/or where individual trees ≥50 cm dbh occurred. Smaller tree stands (<10 stems) and individual trees with a dbh <50 cm were not documented in detail throughout the Site, although the presence of landscaping features is described in general terms. In order to provide an inventory of large trees, both planted and naturally occurring trees ≥50 cm dbh were documented whenever they were encountered. Trees ≥50 cm dbh are described below and are shown in Figures 3 to 8. Trees occurring individually and in small stands were measured with the use of a D-tape, which is a calibrated dbh tape.

The following terms are used throughout this report:

- Diameter at Breast Height (dbh) means the measurement of the trunk of a tree at a height of 120 cm above grade for trees 15 cm diameter or greater, and at a height of 30 cm above grade for trees less than 15 cm diameter.
- The Critical Root Zone (CRZ) is 10 centimeters from the trunk of the tree for every centimeter of trunk dbh. The CRZ is calculated as dbh x 10 cm.

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2.0.2 Significant Woodlot Assessment Methodology (TCR)

The City of Ottawa guidelines for Significant Woodlot evaluation require preparation of an Individual Terms of Reference when evaluating potential Significant Woodlots within the urban area (City of Ottawa 2019). An Individual Terms of Reference has been prepared to support the evaluation of the potential Significant Woodlots within the Site (Refer to Appendix D). The evaluation methodology has also been summarized below.

The City of Ottawa Official Plan (Section 2.4.2), as amended by Official Plan Amendment 179, defines Significant Woodlots in the urban area as any forested area ≥0.8 ha in size supporting woodland 40 years of age or older at the time of evaluation. However, the age criteria has recently been revised to include woodlots 60 years of age or older, as a result of a recent Local Planning Appeal Tribunal (LPAT) decision. The Site occurs within the urban area of the City of Ottawa, and therefore the recently amended urban area criteria apply.

In order to evaluate the potential presence of Significant Woodlots, vegetation communities within the Site were first inventoried and classified according to the vegetation communities identified in the Ecological Land Classification (ELC) manual (OMNRF 1998; Lee 2008) (described above). Once the presence of forest communities within the Site was identified, the size of each forest patch was measured using GIS software. Forest patches ≥0.8 ha in size were identified (Refer to Section 3.3.1 and Figures 9 & 10). As discussed in Section 3.3.1, a total of five (5) forest patches that are ≥0.8 ha in size were identified within the Site, with the largest being approximately 1.59 ha.

Historic air photos made available by the City of Ottawa (2019) and NRCAN (2019) were then utilized to determine the likely age of forest within each of the forest patches ≥0.8 ha in size. As discussed in Section 3.3.2, air photos from 1976 and July 1959 were utilized to evaluate forest age. The historic air photos from 1976 are approximately 43 years old, whereas the historic air photo from July 1959 is approximately 60 years old and most closely matches the 60 year age criteria. Of the five (5) forest patches ≥0.8 ha in size, three (3) appear to include significant forest cover that is ≥60 years of age (Refer to Section 3.3.2 and Figure 11). Therefore, there are three (3) forest patches within the Site which qualify as potential Significant Woodlots under the amended City of Ottawa criteria for the urban area. The significant features and functions of the three (3) potential Significant Woodlots were further evaluated and discussed by reviewing the *Natural Heritage Reference Manual* criteria (OMNRF 2010).

2.0.3 Environmental Impact Statement Methodology

The presence of natural heritage features was assessed by completing the following:

- Site surveys to describe vegetation communities and inventory trees (see above);
- Completion of a Significant Woodlot assessment (see above and Appendix D);
- Site surveys to assess the potential for habitat of Species at Risk (SAR), wetlands, fish habitat, significant wildlife habitat features, and other significant habitat features to be present;
- Examination of aerial imagery to evaluate landscape features;
- Natural Heritage Information Center (NHIC) database review;
- Obtainment of an updated Potential Species at Risk (SAR) List for the Geographic Township of March from the Ontario Ministry of Natural Resources and Forestry (OMNRF);
- Review of Official Plan designations; and
- Review of the background geotechnical report (Paterson 2019).

Detailed surveys to assess natural heritage features were completed as follows:

- **Plant Inventory, Large Tree Inventory and Ecological Land Classification:** See description above.
- **Breeding Bird Survey:** In order to assess the potential presence of avian Species at Risk (SAR) including Bobolink (threatened), Eastern Meadowlark (threatened), Wood Thrush (special concern), Eastern Wood Pewee (special concern), Barn Swallow (threatened), Chimney Swift (threatened), and Bank Swallow (threatened), a breeding bird survey was undertaken following the OMNRF *Wildlife Monitoring Programs and Inventory Techniques - Technical Manual* (Konze & McLaren 1998) Breeding Bird Survey (BBS) method. As discussed below in Section 3.7, due to the absence of potentially suitable habitat, none of these species were anticipated to be likely to occur within the Site. The survey included completion of three (3) site surveys in May and June 2018. The timing and methodology of the surveys followed the requirements outlined in the OMNRF *Survey Methodology under the Endangered Species Act: Dolichonyx oryzivorus (Bobolink)* (OMNRF 2011a). As part of the survey, all interior and exterior surfaces of buildings within the Site were searched to confirm the presence/absence of Barn Swallow nests. Breeding bird surveys were completed in the early morning during suitable weather conditions on May 24th (20 ºC), June 2nd (24 ºC), and June 13th (21 ºC), 2018. Bird survey points are shown below in Figure 12.
- **Marsh Monitoring Program – Amphibian Call Counts:** The two (2) stormwater ponds and the stormwater swales that are present within the Site were surveyed to evaluate the potential presence of breeding amphibians. Amphibian breeding habitat was surveyed according to the *Marsh Monitoring Program – Amphibian Call Counts Method* (Konze and McLaren 1998). This method included three (3) night time surveys in April, May, and June 2018 to survey for

amphibian breeding activity by listening for frog calls. Surveys were completed after sunset on April 26th, May 24th, and June 25th, 2018. Survey conditions and results are presented in detail in Table C.

- **Blanding's Turtle and Snapping Turtle:** A basking survey was completed to survey the two (2) stormwater ponds and the hydrated portions of the stormwater swales, in order to evaluate the potential presence of Blanding's Turtle (threatened) and Snapping Turtle (special concern). Surveys were undertaken following the OMNRF *Occurrence Survey Protocol for Blanding's Turtle in Ontario* (OMNRF 2013). Per the OMNRF protocol, five (5) survey visits were completed between late April and mid-June 2018. Although not required by the survey protocol, an additional sixth survey visit was completed in September 2018 in order to evaluate the potential presence of turtles prior to the overwintering season. Surveys were completed on April 30th, May 8th, May 24th, June 2nd, June 13th, and September 17th, 2018. Survey conditions and results are presented in detail in Table D.
- **Eastern Whip Poor Will and Common Nighthawk:** Surveys for Eastern Whip Poor Will and Common Nighthawk were undertaken following the OMNRF *Draft Survey Protocol for Eastern Whip Poor Will* (OMNRF 2014f). The protocol necessitates that three (3) Whip Poor Will call surveys must be undertaken after dusk (one week before or after the full moon), from mid-May until end of June. Surveys were completed on May 24th, May 31st, and June 25th, 2018. Survey conditions and results are presented in detail in Table E. Whip Poor Will call survey points are shown in Figure 13.
- **Butternut Trees:** During the vegetation surveys and tree inventory, several Butternut Trees were found within the Site. The rules and regulations of the Ontario Endangered Species Act (ESA) require the completion of a Butternut Health Assessment (BHA) in order to assess the health status of the Butternut Trees and subsequent regulatory requirements under the Ontario ESA (OMECP 2019). A BHA was completed in June 2019. Refer to Appendix F for additional detail regarding the BHA methodology.
- **Bat Maternity Roost Assessment (Little Brown Bat, Northern Long Eared Bat):** No caves, bedrock fissures, mining shafts, abandoned buildings, or other features which may function as bat hibernacula habitat were noted within the Site. The OMNRF (2011b) guidelines for bat surveying are outlined in the *Bats and Bat Habitats: Guidelines for Wind Power Projects*. These guidelines state that deciduous and mixed forest habitats have the potential to provide maternity roosting sites. However, in order to potentially provide significant roost habitat, forest patches generally have to be large enough to provide some interior forest habitat (e.g. forest which is more than 100 m from an existing opening) (OMNRF 2010; OMNRF 2011b). As described below in Section 3.3.3, forest cover within the Site primarily occurs either in very small and fragmented stands, and/or as thin stands that are present along the edges of the Site. The largest woodlot within the Site is approximately 1.59 ha in size and is a long and thin feature

(approximately 50 m wide) with houses on one side and the golf greens on the other. There are no forest patches within the Site that are more than 100 m from an opening, and therefore no interior forest habitat exists within the Site. There is therefore negligible habitat within the Site that has the potential to provide bat maternity roost sites, and as such, a bat snag/cavity assessment was not deemed to be required.

- **Aquatic Habitat and Fish Habitat Assessment:** As discussed below in Section 3.4, there are no natural wetlands or watercourses within the Site. The two (2) existing stormwater management ponds and the stormwater management swales are artificial features that are entirely fed by outlet pipes from the surrounding subdivisions and overland flow from the golf course. There is no upstream or downstream connection to natural watercourses or wetlands. As such, a Headwaters Drainage Assessment (HDA) is not anticipated to be required to support the Mississippi Valley Conservation Authority (MVCA) project review. Due to the fact that stormwater ponds are not regulated by the Fisheries Act, a fish habitat assessment was not deemed to be required. Requirements for fish and wildlife salvage during dewatering are discussed in Section 4.4.3.

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3.0 EXISTING CONDITIONS

3.1 Geological Conditions

Paterson Group (2019) note that the Site is predominately flat. The Site is predominantly well drained, although some areas of the golf course are prone to seasonal shallow ponding. Surface conditions generally consist of topsoil overlying a firm to very stiff silty clay deposit. The silty clay deposit is generally underlain by a glacial till deposit. Bedrock outcrops and shallow bedrock were noted in several locations throughout the Site. The overburden thickness to bedrock varies between 0 m and 20 m (Paterson Group 2019).

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3.2 Vegetation Communities (TCR)

The Site is predominantly an artificial landscape dominated by manicured lawns (golf greens) and planted landscaping features, which include a mix of native and non-native trees, including many large trees and both deciduous and coniferous plantings. Natural vegetation communities primarily consist of patches of native deciduous forest and deciduous thickets, which are present principally around the edges of the Site.

For the purposes of this Combined EIS and TCR, landscaping features, individual trees, and tree stands were surveyed and are described in detail where stands of trees occur with approximately ten (10) or more stems and/or where individual trees ≥50 cm dbh occurred. Smaller tree stands (<10 stems) and individual trees with a dbh <50 cm were not documented in detail throughout the Site, although the presence of landscaping features is described in general terms. In order to provide an inventory of large trees, both planted and naturally occurring trees ≥50 cm dbh were documented whenever they were encountered. Trees ≥50 cm dbh are described below and are shown in Figures 3 to 8. Any forest or thickets communities were classified according to ELC criteria. Vegetation features found within the Site include the following:

- Golf Greens;
- Landscaping Features (Individual Trees and Small Stands);
- Tree Stands and Large Trees;
- Dry-Fresh Sugar Maple - Basswood Deciduous Forest (Community A);
- Deciduous Shrub Thicket (Community B);
- Fresh-Moist Poplar Deciduous Forest (Community C);
- Dry-Fresh Sugar Maple – Black Cherry Deciduous Forest (Community D);
- Dry-Fresh Sugar Maple – Ironwood Deciduous Forest (Community E);
- Fresh-Moist White Spruce - Hardwood Mixed Forest (Community F);
- Dry-Fresh White Ash – Hardwood Deciduous Forest (Community G); and
- Silver Maple Mineral Deciduous Swamp (Community H).

Due to the large size of the Site and its layout, it was necessary to present vegetation community mapping over multiple figures, each of which shows a section of the Site. Figure 2 divides the Site into six (6) mapping sections. Figures 3 to 8 show vegetation communities within each section of the Site. Appendix A includes photos of the vegetation communities. Appendix B includes a list of plant species noted during the vegetation surveys. Each of the vegetation communities is described in greater detail below.

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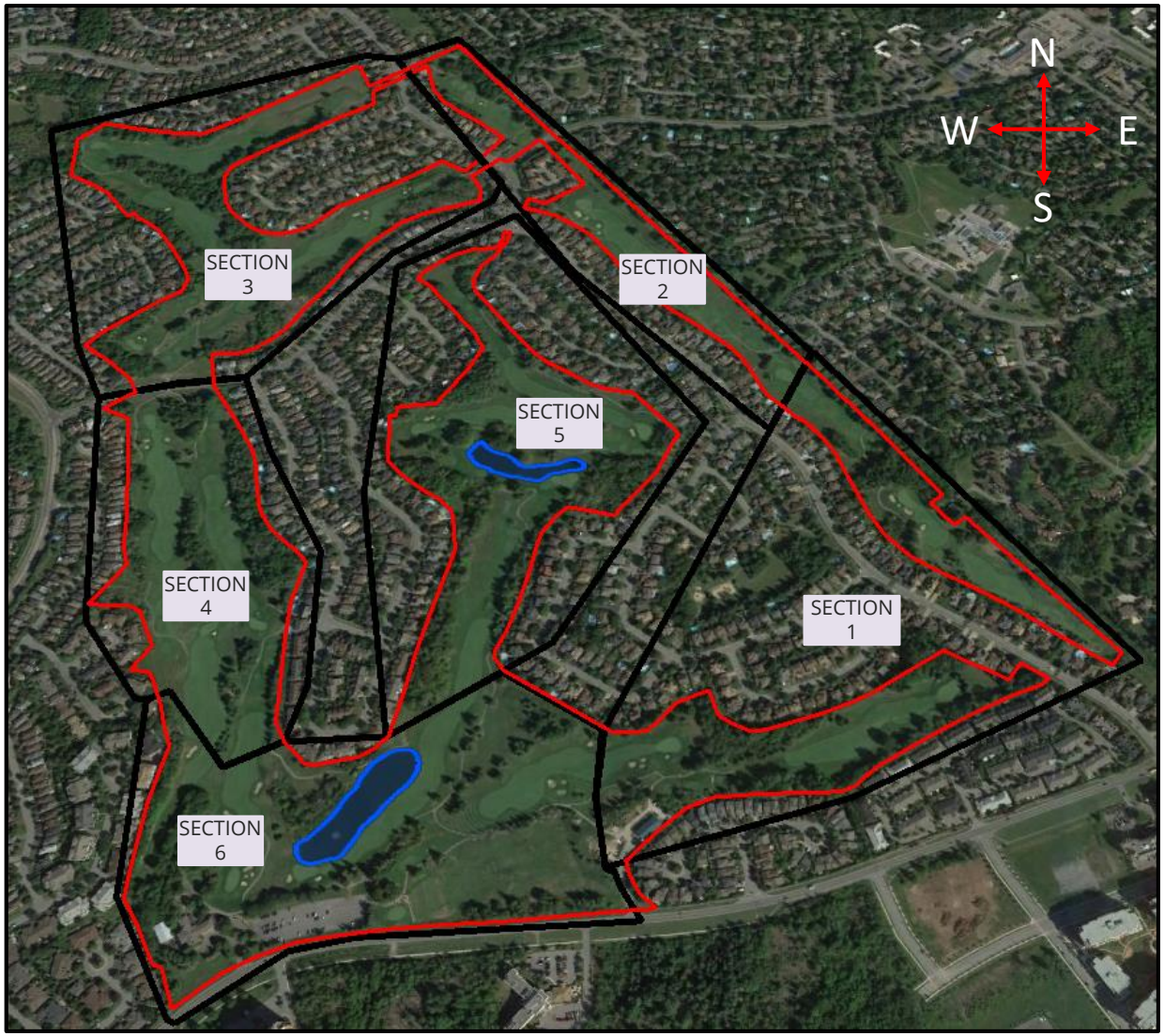
FIGURE 2: VEGETATION MAPPING OVERVIEW

Kanata Golf and Country Club Redevelopment

Combined Environmental Impact Statement and Tree Conservation Report



Please Note: This is not a legal land survey. All dimensions and locations are shown as approximate.

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FIGURE 3: VEGETATION MAPPING – SECTION 1

Kanata Golf and Country Club Redevelopment

Combined Environmental Impact Statement and Tree Conservation Report

Please Note: This is not a legal land survey. All dimensions and locations are shown as approximate.

- Site Limits
- Section Boundary
- 6 - Tree/Tree Stand <50 cm dbh
- 7 - Tree/Tree Stand ≥50 cm dbh

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FIGURE 4: VEGETATION MAPPING – SECTION 2

Kanata Golf and Country Club Redevelopment

Combined Environmental Impact Statement and Tree Conservation Report

Please Note: This is not a legal land survey. All dimensions and locations are shown as approximate.

- Site Limits
- Section Boundary
- Tree/Tree Stand <50 cm dbh
- Tree/Tree Stand ≥50 cm dbh

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FIGURE 5: VEGETATION MAPPING – SECTION 3

Kanata Golf and Country Club Redevelopment

Combined Environmental Impact Statement and Tree Conservation Report

Please Note: This is not a legal land survey. All dimensions and locations are shown as approximate.

- Site Limits
- Section Boundary
- Tree/Tree Stand <50 cm dbh
- Tree/Tree Stand ≥50 cm dbh

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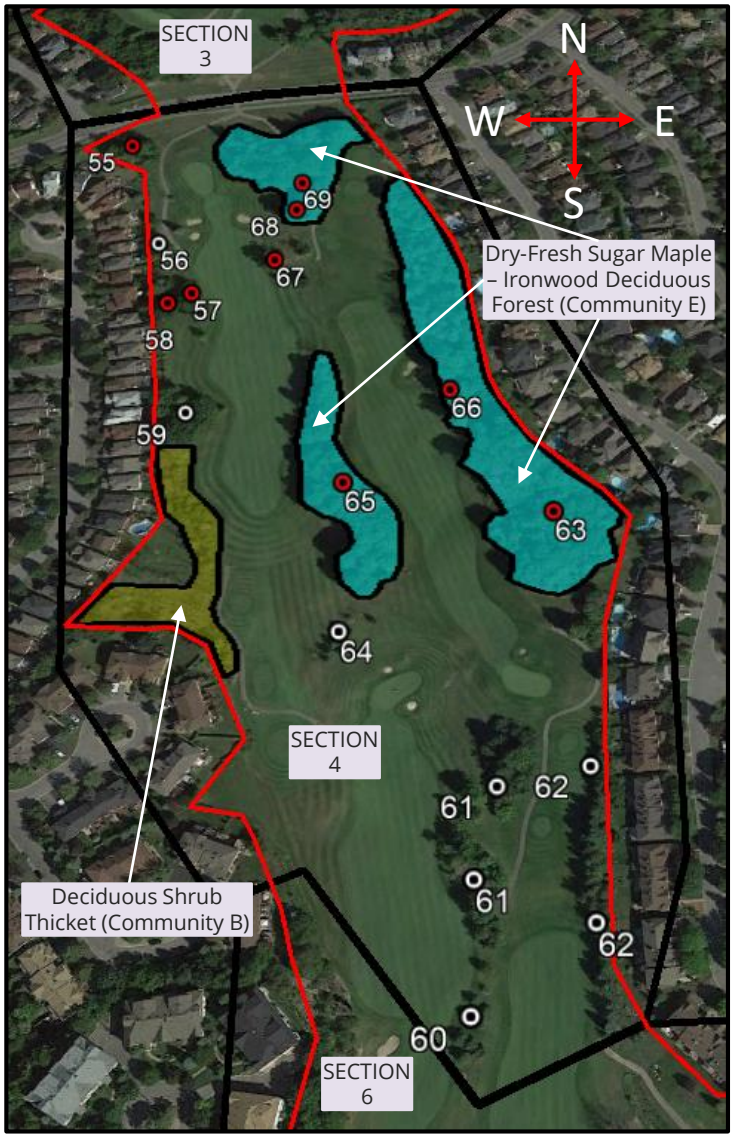
FIGURE 6: VEGETATION MAPPING – SECTION 4

Kanata Golf and Country Club Redevelopment

Combined Environmental Impact Statement and Tree Conservation Report



Please Note: This is not a legal land survey. All dimensions and locations are shown as approximate.

- Site Limits
- Section Boundary
- Tree/Tree Stand <50 cm dbh
- Tree/Tree Stand ≥50 cm dbh

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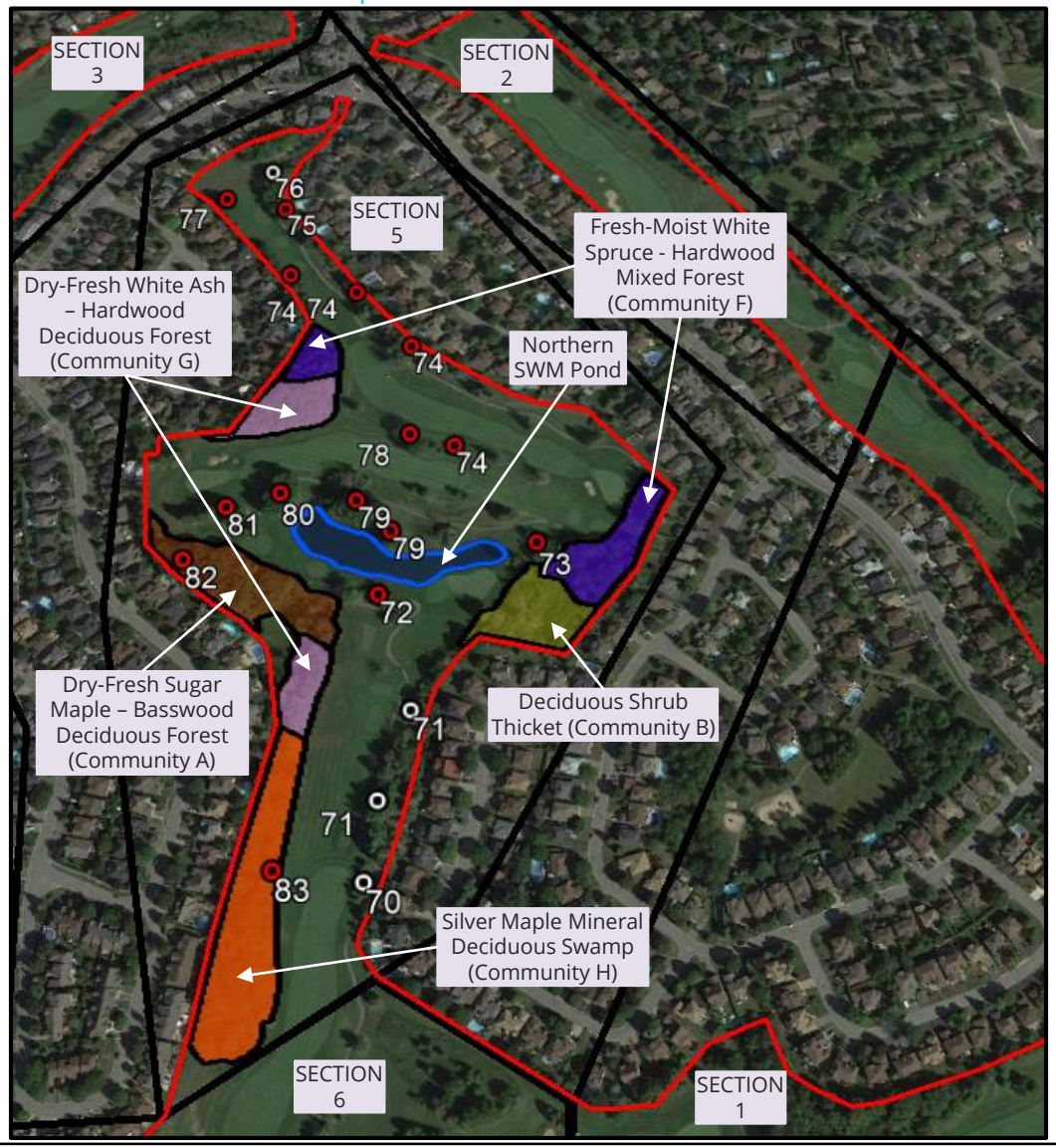
FIGURE 7: VEGETATION MAPPING – SECTION 5

Kanata Golf and Country Club Redevelopment

Combined Environmental Impact Statement and Tree Conservation Report



Please Note: This is not a legal land survey. All dimensions and locations are shown as approximate.

- Site Limits
- Section Boundary
- Tree/Tree Stand <50 cm dbh
- Tree/Tree Stand ≥50 cm dbh

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FIGURE 8: VEGETATION MAPPING – SECTION 6

Kanata Golf and Country Club Redevelopment

Combined Environmental Impact Statement and Tree Conservation Report

- Site Limits
- Section Boundary
- Tree/Tree Stand <50 cm dbh
- Tree/Tree Stand ≥50 cm dbh

Please Note: This is not a legal land survey. All dimensions and locations are shown as approximate.

3.2.1 Golf Greens

The golf greens consist of manicured lawn dominated by domestic grasses. Due to ongoing landscaping and maintenance as part of the golf course operation, shrubs, tree stems, and herbaceous groundcover generally do not occur within the greens, except where planted as landscaping features. Weedy species are generally absent as a result of landscaping activities, although a few White Clover, Red Clover, Dandelion and Common Plantain are present among the grasses.

3.2.2 Landscaping Features (TCR)

Planted trees stands with approximately ten (10) or more stems are described below. As noted above, landscaping features that consist of smaller planted tree stands (<10 stems) and individual planted trees with a dbh <50 cm were not documented in detail throughout the Site. In general, planted trees include a mixture of Red Pine, White Pine, Scots Pine, White Spruce, Norway Spruce, Sugar Maple, Silver Maple, Honey Locust, Bur Oak and Horse Chestnuts (planted in a few locations), varying in size between approximately 10 cm and 40 cm dbh. Several planted gardens with domestic flowers and shrubs are also present in various locations throughout the Site.

3.2.3 Tree Stands and Large Trees (TCR)

The following is a list of tree stands with approximately ten (10) or more stems and individual trees ≥50 cm dbh in size. Features which are described below as 'overgrown' include trees that are overgrown with Deciduous Shrub Thickets. Throughout the Site, the Deciduous Shrub Thickets have similar shrub and groundcover composition as described below for Community B. Tree Stands and Large Trees are listed below, and are numbered in Figures 3 to 8:

- **Feature #1:** Feature #1 is a 67 cm dbh Butternut.
- **Feature #2:** Feature #2 is a 57 cm dbh Bur Oak.
- **Feature #3:** Feature #3 is a stand of Norway Spruce and White Spruce which are between approximately 10 cm to 25 cm dbh in size.
- **Feature #4:** Feature #4 is a stand of Manitoba Maples with a dbh between approximately 10 cm to 40 cm dbh. The stand is overgrown with Deciduous Shrub Thicket (see Community B below).
- **Feature #5:** Feature #5 is a stand of White Spruce, Norway Spruce, Sugar Maple and White Pine which are between approximately 10 cm and 25 cm dbh.
- **Feature #6:** Feature #6 includes a 48 cm and a 47 cm dbh Bitternut Hickory, which are overgrown with Deciduous Shrub Thicket (see Community B below).
- **Feature #7:** Feature #7 includes a 54 cm and a 71 cm dbh Bur Oak.
- **Feature #8:** Feature #8 is a 57 cm dbh Bur Oak.

- **Feature #9:** Feature #9 is a stand of Trembling Aspen up to 20 cm dbh, which is overgrown with Deciduous Shrub Thicket (see Community B below).
- **Feature #10:** Feature #10 is a row of approximately twenty (20) White Pine, which vary between approximately 30 cm to 50 cm dbh.
- **Feature #11:** Feature #11 includes a 48 cm and a 64 cm dbh Bur Oak.
- **Feature #12:** Feature #12 is a stand of Ironwood and Bur Oak growing around a bedrock outcrop. Trees within the stand vary between approximately 10 cm and 30 cm dbh,
- **Feature #13:** Feature #13 is a Weeping Willow with a dbh of over 1 m.
- **Feature #14:** Feature #14 is a Deciduous Shrub Thicket dominated by Staghorn Sumac (see Community B below).
- **Feature #15:** Feature #15 is an 84 cm dbh Bur Oak.
- **Feature #16:** Feature #16 is a 96 cm dbh Bur Oak.
- **Feature #17:** Feature #17 is a stand of Norway Spruce and Silver Maple, which vary between approximately 10 cm and 30 cm dbh.
- **Feature #18:** Feature #18 is a stand of approximately twenty (20) White Pine, which vary between approximately 30 cm and 71 cm dbh. The base of the trees is overgrown with Deciduous Shrub Thicket.
- **Feature #19:** Feature #19 is a stand of White Spruce, Norway Spruce, and Bur Oak which vary between approximately 10 cm and 30 cm dbh. The stand is overgrown with Deciduous Shrub Thicket (see Community B, below).
- **Feature #20:** Feature #20 is an 84 cm dbh Bur Oak.
- **Feature #21:** Feature #21 is a stand of White Cedar that vary between approximately 10 cm and 20 cm dbh.
- **Feature #22:** Feature #22 includes approximately seven (7) White Pine and four (4) White Spruce. One (1) White Spruce is 54 cm dbh in size, whereas the other trees vary between approximately 10 cm and 30 cm dbh.
- **Feature #23:** Feature #23 is a stand of approximately eight (8) White Pine and two (2) Red Pine that vary between approximately 40 cm and 60 cm dbh.
- **Feature #24:** Feature #24 is a mixed stand of Basswood, White Spruce, Manitoba Maple, American Elm and Black Cherry, with stems varying between approximately 10 cm and 30 cm dbh. The stand is overgrown with Deciduous Shrub Thicket (Community B, see below).
- **Feature #25:** Feature #25 is a Deciduous Shrub Thicket (Community B, see below).
- **Feature #26:** Feature #26 is a 57 cm dbh American Elm.
- **Feature #27:** Feature #27 is a stand of Basswood, Bur Oak, and Sugar Maple which vary between approximately 10 cm and 25 cm dbh.
- **Feature #28:** Feature #28 is a 97 cm dbh Bur Oak.
- **Feature #29:** Feature #29 is a 74 cm dbh Sugar Maple.

- **Feature #30:** Feature #30 is a 56 cm dbh American Elm.
- **Feature #31:** Feature #31 includes a 47 cm dbh Sugar Maple and a 65 cm dbh Basswood.
- **Feature #32:** Feature #32 is a 102 cm dbh Silver Maple.
- **Feature #33:** Feature #33 includes a 50 cm and a 48 cm dbh Honey Locust.
- **Feature #34:** Feature #34 includes a line of Basswood which are between approximately 40 cm and 60 cm dbh in size. The tree stand is overgrown with Deciduous Shrub Thicket (Community B, see below).
- **Feature #35:** Feature #35 is a stand of Manitoba Maple up to 20 cm dbh in size, which is overgrown with Deciduous Shrub Thicket (Community B, see below).
- **Feature #36:** Feature #36 includes a 53 cm, 48 cm and 54 cm dbh White Pine and White Cedars between approximately 10 cm and 20 cm dbh.
- **Feature #37:** Feature #37 is a stand of White Spruce and White Pine between approximately 30 cm and 40 cm dbh. The stand is overgrown with Deciduous Shrub Thicket (Community B, see below).
- **Feature #38:** Feature #38 is a dying 68 cm dbh White Ash.
- **Feature #39:** Feature #39 is a stand of dead White Ash between approximately 10 cm and 20 cm dbh.
- **Feature #40:** Feature #40 includes six (6) Red Pine and five (5) White Pine between approximately 20 cm and 40 cm dbh.
- **Feature #41:** Feature #41 is an 84 cm dbh Bitternut Hickory.
- **Feature #42:** Feature #42 is a stand of White Pine between approximately 40 cm and 60 cm dbh.
- **Feature #43:** Feature #43 is a stand of Trembling Aspen and dead/dying White Ash between approximately 10 cm and 30 cm dbh. Sugar Maple and American Elm are also present. The stand is overgrown with Deciduous Shrub Thicket (Community B, see below).
- **Feature #44:** Feature #44 is a stand of Sugar Maple and Domestic Apple with a dbh between approximately 10 cm and 20 cm.
- **Feature #45:** Feature #45 is a stand of Red Pine and White Pine with a dbh between approximately 10 cm and 30 cm.
- **Feature #46:** Feature #46 is a stand of White Pine and Sugar Maple between approximately 30 cm and 60 cm dbh.
- **Feature #47:** Feature #47 is a stand of Trembling Aspen, Sugar Maple, American Elm, White Ash, and Basswood between approximately 10 cm and 25 cm dbh.
- **Feature #48:** Feature #48 is a stand of White Pine and Sugar Maple between approximately 40 cm and 60 cm dbh. The stand is overgrown with Deciduous Shrub Thicket (Community B, see below).
- **Feature #49:** Feature #49 is a 76 cm dbh American Elm.
- **Feature #50:** Feature #50 is an 86 cm dbh Bitternut Hickory.

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- **Feature #51:** Feature #51 is a 76 cm dbh White Pine.
- **Feature #52:** Feature #52 is a 79 cm dbh Sugar Maple.
- **Feature #53:** Feature #53 is a stand of Red Pine and White Spruce between approximately 20 cm and 30 cm dbh.
- **Feature #54:** Feature #54 is a 63 cm dbh Silver Maple.
- **Feature #55:** Feature #55 is a stand of White Pines between approximately 40 cm and 60 cm dbh. The base of the trees is overgrown with Deciduous Shrub Thicket (Community B, see below).
- **Feature #56:** Feature #56 is a stand of Ironwood, White Ash, and Sugar Maple between approximately 10 cm and 30 cm dbh. The stand is overgrown with Deciduous Shrub Thicket (Community B, see below).
- **Feature #57:** Feature #57 includes a 94 cm and 76 cm dbh Bur Oak.
- **Feature #58:** Feature #58 is a 77 cm dbh Bur Oak.
- **Feature #59:** Feature #59 is a stand of Red Oak, Sugar Maple, Basswood, and White Ash between approximately 10 cm and 45 cm dbh.
- **Feature #60:** Feature #60 is a stand of Red Pines between approximately 10 cm and 20 cm dbh.
- **Feature #61:** Feature #61 is a stand of Sugar Maples between approximately 20 cm and 40 cm dbh. The stand is overgrown with Deciduous Shrub Thicket (Community B, see below).
- **Feature #62:** Feature #62 includes White Pine, Red Pine, Norway Spruce, and White Spruce between approximately 20 cm and 40 cm dbh, which are planted along the edge of the green at the property boundary.
- **Feature #63:** Feature #63 is a 92 cm dbh Sugar Maple.
- **Feature #64:** Feature #64 includes a stand of White Pines less than 20 cm dbh.
- **Feature #65:** Feature #65 is a Sugar Maple with a dbh of over 1 m.
- **Feature #66:** Feature #66 is a row of large Sugar Maple and Red Oak, which are between approximately 40 cm and 60 cm dbh in size.
- **Feature #67:** Feature #67 is a stand of Sugar Maples approximately 20 cm to 40 cm dbh in size. One (1) large Sugar Maple has a dbh of over 1 m.
- **Feature #68:** Feature #68 includes a 94 cm and a 73 cm dbh Sugar Maple.
- **Feature #69:** Feature #69 includes a 46 cm and 52 cm Bur Oak and an 85 cm dbh Red Oak.
- **Feature #70:** Feature #70 is a stand of Red Pine, White Pine, Norway Spruce and White Spruce planted along the edge of the green at the property boundary. Trees vary between approximately 20 cm and 30 cm dbh.
- **Feature #71:** Feature #71 is a stand of Trembling Aspen, White Birch, Sugar Maple, White Spruce, American Elm and dead White Ash growing along the edge of the green at the property boundary. Trees vary between approximately 10 cm and 40 cm dbh.

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- **Feature #72:** Feature #72 includes a 72 cm dbh Sugar Maple and a Sugar Maple with a dbh of over 1 m.
- **Feature #73:** Feature #73 is a stand of White Spruce between approximately 40 cm and 60 cm dbh.
- **Feature #74:** Feature #74 includes several stands of White Spruce, Norway Spruce, Red Pine and White Pine, which are planted in several locations along the greens and along the property line. Trees vary between approximately 20 cm and 60 cm dbh.
- **Feature #75:** Feature #75 includes three (3) Sugar Maples, each of which have a dbh of over 1 m.
- **Feature #76:** Feature #76 is a stand of Sugar Maple, Basswood and Ironwood between approximately 10 cm and 40 cm dbh.
- **Feature #77:** Feature #77 is a Sugar Maple with a dbh of over 1 m.
- **Feature #78:** Feature #78 includes a 68 cm and a 90 cm dbh Bur Oak
- **Feature #79:** Feature #79 includes a 76 cm Bur Oak, a Bur Oak with a dbh of over 1 m, two (2) Silver Maples with a dbh of over 1 m, and two (2) Silver Maples with multiple stems measuring 71 cm, 38 cm, 37 cm, 35 cm, and 43 cm dbh.
- **Feature #80:** Feature #80 includes a stand of Sugar Maples between approximately 10 cm and 40 cm dbh in size. An 84 cm dbh Sugar Maple is present within the stand.
- **Feature #81:** Feature #81 is a stand of Sugar Maples, White Cedar, and White Spruce between approximately 20 cm and 40 cm dbh.
- **Feature #82:** Feature #82 is a Sugar Maple with a dbh of over 1 m.
- **Feature #83:** Feature #83 includes a 71 cm dbh Silver Maple and a Silver Maple with a dbh of over 1 m.
- **Feature #84:** Feature #84 includes several stands of planted White Spruce, Norway Spruce, Sugar Maple, Red Pine, White Pine, Scots Pine, and White Cedar between approximately 20 cm and 60 cm dbh. The tree stands are planted in several clusters around the golf greens in Section 6.
- **Feature #85:** Feature #85 is a stand of White Spruce and White Pine between approximately 20 cm and 40 cm dbh.
- **Feature #86:** Feature #86 includes a stand of young Bur Oak, Trembling Aspen, Basswood and White Ash between approximately 10 cm and 30 cm dbh. The stand is overgrown with Deciduous Shrub Thicket (Community B, see below).
- **Feature #87:** Feature #87 includes a stand of White Cedar, Trembling Aspen, Ironwood, American Elm and Staghorn Sumac between approximately 10 cm and 40 cm dbh. The stand is overgrown with Deciduous Shrub Thicket (Community B, see below).
- **Feature #88:** Feature #88 is a stand of White Spruce and White Pine planted adjacent to the parking lot. Trees vary in size between approximately 20 cm and 40 cm dbh.

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- **Feature #89:** Feature #89 includes a row of planted Silver Maples adjacent to the parking lot. Trees vary in size between approximately 20 cm and 40 cm dbh.
- **Feature #90:** Feature #90 includes Silver Maples, Sugar Maples, White Pine, Norway Spruce and White Spruce planted around the clubhouse. Trees vary in size between approximately 20 cm and 40 cm dbh.
- **Feature #91:** Feature #91 is a 58 cm dbh Butternut.
- **Feature #92:** Feature #92 is a large multi-stemmed Basswood. The tree has four (4) stems which vary in size between approximately 60 cm and 90 cm dbh.
- **Feature #93:** Feature #93 includes three (3) large Bur Oaks and three (3) large Sugar Maples, each between approximately 60 cm and 90 cm dbh.
- **Feature #94:** Feature #94 is a 76 cm dbh Basswood.

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3.2.4 Forest and Thicket Communities (TCR)

Tree inventory plots were completed in all forested communities. The number of plots and the tree size measurements are summarized below in Tables A & B. The following forest and thicket communities were identified within the Site:

- **Dry-Fresh Sugar Maple - Basswood Deciduous Forest (Community A):** Community A is dominated by Sugar Maple. Basswood, American Elm, White Ash, Black Cherry, Butternut, Largetooth Aspen, American Beech, Trembling Aspen, Bur Oak and White Birch also occur. Most of the Community A forest patches are moderately aged, with the majority of trees between approximately 10 cm and 40 cm dbh. Shrub cover includes Common Buckthorn, Tartarian Honeysuckle, Lilac, Wild Red Raspberry, Red Osier Dogwood, Alternate Leaved Dogwood, Domestic Apple, and Riverbank Grape, all of which were principally found growing around the forest edges and within openings. Within the forest interior, shrub cover is generally sparse, with Riverbank Grape and Prickly Gooseberry occurring sporadically. Groundcover includes a typical mixture of deciduous forest species including Bracken Fern, Spinulose Wood Fern, Downy Yellow Violet, White Baneberry, Wild Sarsaparilla, Trout Lily, Day Lily, False Solomon's Seal, White Trillium, Virginia Creeper, and Common Blue Violet. Forest openings were generally dominated by Deciduous Shrub Thickets, with a similar composition as described below (Community B).
- **Deciduous Shrub Thicket (Community B):** Deciduous Shrub Thickets are found throughout the Site in several locations. The large thickets found in Section 3 are growing around several large bedrock outcrops. The shrub thickets are dominated by deciduous shrubs, with Common Buckthorn and Staghorn Sumac being the most common shrubs in most areas. However, Lilac, Glossy Buckthorn, Tartarian Honeysuckle, Choke Cherry, Alternate Leaved Dogwood, Red Osier Dogwood, Wild Red Raspberry, Domestic Apple, Riverbank Grape, and Purple Flowering Raspberry are also abundant throughout the Site. Trees found within the shrub thickets include young stems (generally 10 cm to 30 cm dbh) of many of the deciduous and coniferous trees that are planted and/or occur naturally throughout the Site. Groundcover includes a mixture of native and non-native weedy species including Brome Grass, Meadow Grass, Timothy, Garlic Mustard, Common Ragweed, Canada Anemone, Common Burdock, Common Milkweed, Yellow Rocket, Canada Thistle, Bull Thistle, Queen Anne's Lace, Philadelphia Fleabane, Common Strawberry, Ox-eye Daisy, Common Buttercup, Canada Goldenrod, New England Aster, Small White Aster, Dandelion, Red Clover, White Clover, Common Mullein, Virginia Creeper, and Tufted Vetch. Thick colonies of the highly invasive Dog Strangling Vine are present in some areas.
- **Fresh-Moist Poplar Deciduous Forest (Community C):** Community C is dominated by Large Tooth Aspen, with Sugar Maple, White Ash, American Elm and Bur Oak well represented. Butternut are also present within Community C. The forest is moderately aged, with the majority of trees between approximately 10 cm and 40 cm dbh. Shrub cover includes Common

Buckthorn, Tartarian Honeysuckle, Lilac, Wild Red Raspberry, Red Osier Dogwood, Alternate Leaved Dogwood, Domestic Apple, and Riverbank Grape, all of which were principally found growing around the forest edges and within openings. Within the forest interior, shrub cover is generally sparse, with Riverbank Grape, Virginia Creeper and Skunk Currant occurring sporadically. Groundcover included Jack in the Pulpit, White Baneberry, Lady Fern, Woolly Sweet Cicely, White Trillium, and Trout Lily.

- **Dry-Fresh Sugar Maple – Black Cherry Deciduous Forest (Community D):** Community D differs from Community A primarily due to the fact that Sugar Maple is comparatively less dominant in Community D. Black Cherry, Basswood, and White Ash account for a higher proportion of trees within Community D (compared to Community A). The forest is relatively young, with the majority of trees between approximately 10 cm and 30 cm dbh. Shrub and groundcover within Community D is similar as described above for Community A.
- **Dry-Fresh Sugar Maple – Ironwood Deciduous Forest (Community E):** Community E differs from Community A primarily due to the fact that Sugar Maple and Ironwood are co-dominant. Basswood, White Ash, and Red Oak are also well represented. White Pine, White Birch, Bitternut Hickory and Black Cherry occur within Community E, but are relatively scarce. Most Community E forest patches are moderately aged, with the majority of trees between approximately 10 cm and 40 cm dbh. Shrub and groundcover within Community E is similar as described above for Community A.
- **Fresh-Moist White Spruce – Hardwood Mixed Forest (Community F):** Community F includes two (2) small patches of Mixed Forest that are found in Section 5. The Mixed Forest is dominated by White Spruce, with Sugar Maple and American Elm well represented. White Cedar, White Ash, Trembling Aspen and Black Cherry are also present. Notably, several large Butternut Trees are present in the eastern portion of Community F. The White Spruce, White Cedar and Butternut Trees range from approximately 20 cm to 50 cm dbh, and are comparatively larger than the other tree species. This suggests that the coniferous stems and Butternut may be older plantings, around which younger hardwood stems have recently grown. Shrub cover includes Common Buckthorn, Purple Flowering Raspberry, Riverbank Grape and Skunk Currant. Groundcover includes Sensitive Fern, White Baneberry, Wild Sarsaparilla, Virginia Creeper, and Common Blue Violet.
- **Dry-Fresh White Ash – Hardwood Deciduous Forest (Community G):** Community G is dominated by dead/dying White Ash trees with American Elm, Sugar Maple, and other hardwoods also being present. The forest is moderately aged, with the majority of trees between approximately 10 cm and 40 cm dbh. Shrub and groundcover within Community G reflects the highly disturbed and degraded condition of the forest, and is dominated by invasive Garlic Mustard and Common Buckthorn.

- **Silver Maple Mineral Deciduous Swamp (Community H):** Community H is a small area of Silver Maple Swamp that is present around the Stormwater Infiltration Swale in Section 5. Community H is dominated by Silver Maples, although Weeping Willow and Red Maple are also present. Shrub cover is generally sparse. Groundcover surrounding the Silver Maples and along the edges of the Stormwater Infiltration Swale includes Common Cattail, Purple Loosestrife, Reed Canary Grass, Spotted Touch Me Not, various sedges, and Sensitive Fern.

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Table A: Forest Communities (Part 1)					
Common Name	**Scientific Name**	**Average DBH**	**DBH Standard Deviation**	**% Occupancy**	**Estimated Stems Per Hectare***
Dry-Fresh Sugar Maple - Basswood Deciduous Forest (Community A - 8 Plots)					
Sugar Maple	*Acer saccharum*	21	8	50%	1325
Basswood	*Tilia americana*	23	11	17%	450
American Elm	*Ulmus americana*	24	8	7%	175
White Ash	*Fraxinus americana*	22	10	6%	150
Black Cherry	*Prunus serotina*	23	7	6%	150
Butternut	*Juglans cinerea*	31	15	5%	125
Largetooth Aspen	*Populus grandidentata*	22	8	3%	75
American Beech	*Fagus grandifolia*	16	7	3%	75
Trembling Aspen	*Populus tremuloides*	17	10	2%	50
Bur Oak	*Quercus macrocarpa*	19	1	2%	50
White Birch	*Betula papyrifera*	40	1	2%	50
Fresh-Moist Poplar Deciduous Forest (Community C - 1 Plot)					
Largetooth Aspen	*Populus grandidentata*	29	10	45%	1800
Sugar Maple	*Acer saccharum*	14	2	15%	600
White Ash	*Fraxinus americana*	12	3	15%	600
American Elm	*Ulmus americana*	29	17	10%	400
Bur Oak	*Quercus macrocarpa*	15	6	10%	400
Butternut	*Juglans cinerea*	25	N/A	5%	200
Dry-Fresh Sugar Maple - Black Cherry Deciduous Forest (Community D - 2 Plots)					
Sugar Maple	*Acer saccharum*	19	6	38%	800
Black Cherry	*Prunus serotina*	23	4	29%	600
White Ash	*Fraxinus americana*	24	9	24%	500
Basswood	*Tilia americana*	23	13	10%	200

N/A Values in the DBH Standard Deviation are due to only one tree of that species being observed within the sample plot. Zero values are due to all trees of that species being the same size.
**Trees >50 cm were measured and are described in the text (above). However, they are not included in the tables, as they disproportionately affect the average tree size.

Table B: Forest Communities (Part 2)					
Common Name	**Scientific Name**	**Average DBH**	**DBH Standard Deviation**	**% Occupancy**	**Estimated Stems Per Hectare***
Dry-Fresh Sugar Maple - Ironwood Deciduous Forest (Community E - 6 Plots)					
Ironwood	*Ostrya virginiana*	15	3	35%	867
Sugar Maple	*Acer saccharum*	22	11	33%	833
Basswood	*Tilia americana*	26	12	13%	333
White Ash	*Fraxinus americana*	18	8	5%	133
Red Oak	*Quercus rubra*	29	15	5%	133
White Pine	*Pinus strobus*	33	9	4%	100
White Birch	*Betula papyrifera*	29	2	3%	67
Black Cherry	*Prunus serotina*	19	N/A	1%	33
Fresh-Moist White Spruce - Hardwood Mixed Forest (Community F - 2 Plots)					
White Spruce	*Picea glauca*	29	12	37%	1000
Sugar Maple	*Acer saccharum*	14	5	19%	500
American Elm	*Ulmus americana*	14	4	11%	300
White Cedar	*Thuja occidentalis*	28	13	7%	200
White Ash	*Fraxinus americana*	17	2	7%	200
Trembling Aspen	*Populus tremuloides*	15	5	7%	200
Butternut	*Juglans cinerea*	30	15	7%	200
Black Cherry	*Prunus serotina*	18	N/A	4%	100
Dry-Fresh White Ash - Hardwood Deciduous Forest (Community G - 1 Plot)					
White Ash	*Fraxinus americana*	24	9	54%	1400
American Elm	*Ulmus americana*	17	8	23%	600
Sugar Maple	*Acer saccharum*	15	5	23%	600
Silver Maple Mineral Deciduous Swamp (Community H - 1 Plot)					
Silver Maple	*Acer saccharinum*	27	15	100%	1400

N/A Values in the DBH Standard Deviation are due to only one tree of that species being observed within the sample plot. Zero values are due to all trees of that species being the same size.
**Trees >50 cm were measured and are described in the text (above). However, they are not included in the tables, as they disproportionately affect the average tree size.

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3.3 Significant Woodlot Assessment (TCR)

The City of Ottawa guidelines for Significant Woodlot evaluation require preparation of an Individual Terms of Reference when evaluating potential Significant Woodlots within the urban area (City of Ottawa 2019). An Individual Terms of Reference has been prepared to support the evaluation of the potential Significant Woodlots within the Site (Refer to Appendix D). The evaluation methodology has also been summarized in Section 2.0.2.

The City of Ottawa Official Plan (Section 2.4.2), as amended by Official Plan Amendment 179, defines Significant Woodlots in the urban area as any forested area ≥0.8 ha in size supporting woodland 40 years of age or older at the time of evaluation. However, the age criteria has recently been revised to include woodlots 60 years of age or older, as a result of a recent Local Planning Appeal Tribunal (LPAT) decision. The Site occurs within the urban area of the City of Ottawa, and therefore the recently amended urban area criteria apply.

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3.3.1 Significant Woodlot Assessment – Woodlot Sizes (TCR)

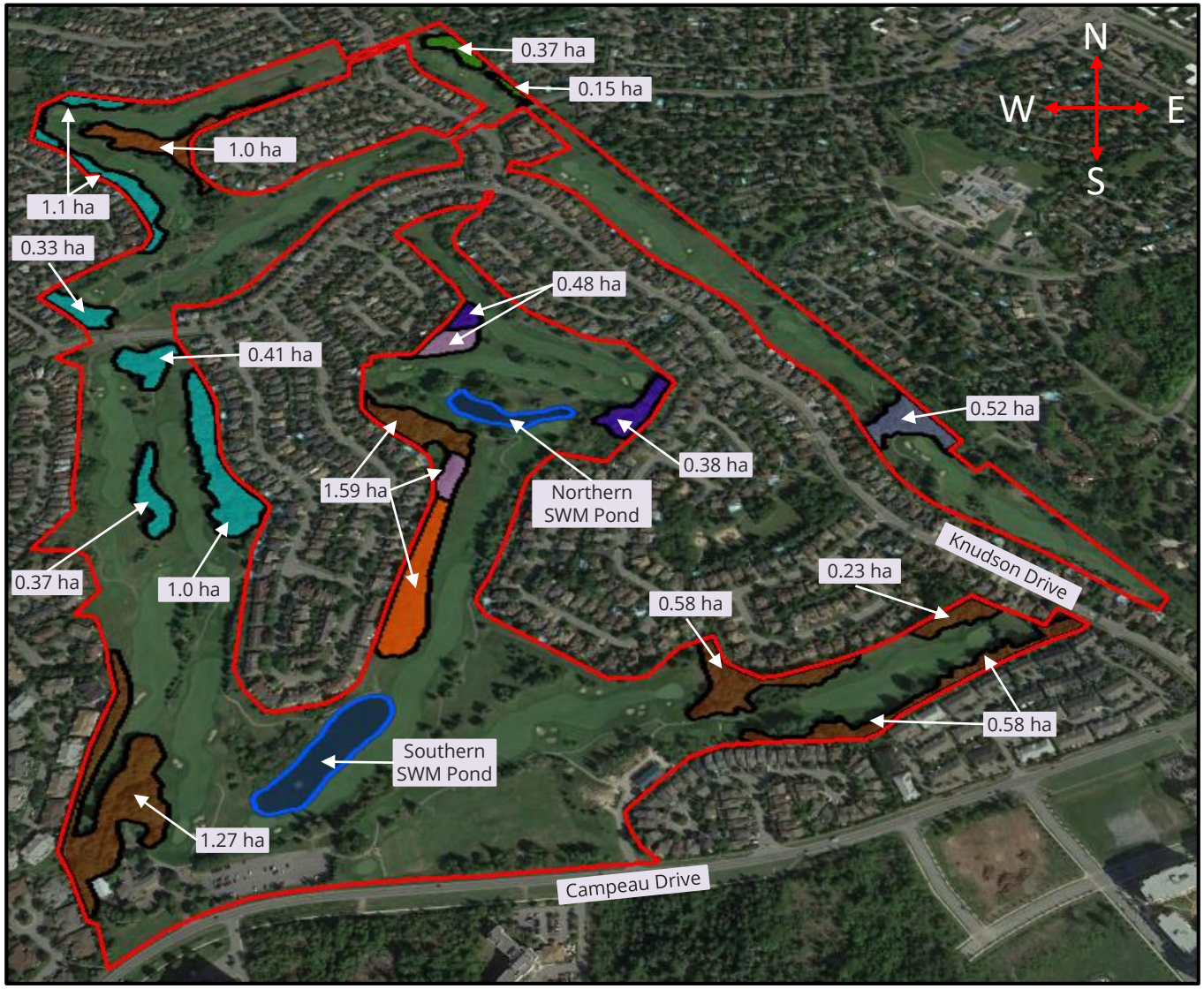
In order to evaluate the potential presence of Significant Woodlots, vegetation communities within the Site were first inventoried and classified according to the vegetation communities identified in the Ecological Land Classification (ELC) manual (OMNRF 1998; Lee 2008) (described above). The size of each forest patch within the Site is shown below in Figure 9. As shown in Figure 9, the majority of forest patches within the Site are small and fragmented. A total of five (5) forest patches that are ≥0.8 ha in size were identified within the Site, with the largest being approximately 1.59 ha. Forest patches ≥0.8 ha in size are shown in Figure 10. The five (5) forest patches ≥0.8 ha in size have been labelled as Woodlots A to E. These include the following:

- **Woodlot A:** Woodlot A is approximately 1.1 ha in size and is classified entirely as Dry-Fresh Sugar Maple – Ironwood Deciduous Forest (Community E).
- **Woodlot B:** Woodlot B is approximately 1.0 ha in size and is classified entirely as Dry-Fresh Sugar Maple – Basswood Deciduous Forest (Community A).
- **Woodlot C:** Woodlot C is approximately 1.0 ha in size and is classified entirely as Dry-Fresh Sugar Maple – Ironwood Deciduous Forest (Community E).
- **Woodlot D:** Woodlot D is approximately 1.59 ha in size and includes Dry-Fresh Sugar Maple – Basswood Deciduous Forest (Community A), Dry-Fresh White Ash – Hardwood Deciduous Forest (Community G), and Silver Maple Deciduous Swamp (Community H).
- **Woodlot E:** Woodlot E is approximately 1.27 ha in size and is classified entirely as Dry-Fresh Sugar Maple – Basswood Deciduous Forest (Community A).

FIGURE 9: FOREST ELC COMMUNITIES – WOODLOT SIZES

August 2019

Kanata Golf and Country Club Redevelopment
Combined Environmental Impact Statement and Tree Conservation Report



- Site Limits

Please Note: This is not a legal land survey. All dimensions and locations are shown as approximate. Only Ecological Land Classification (ELC) Forest Communities are shown. Thicket communities and tree stands are shown on Figures 3 to 8.

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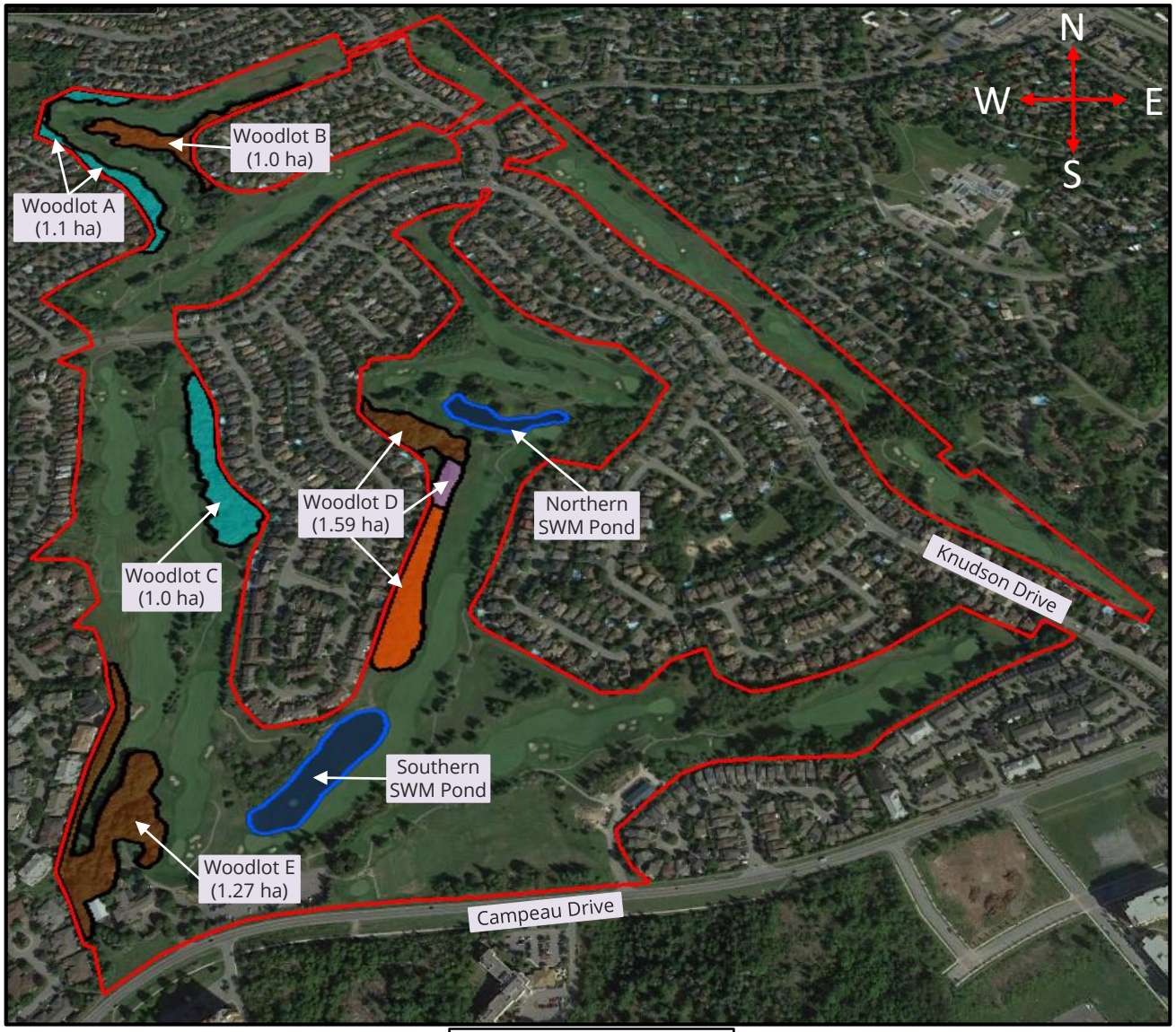
FIGURE 10: FOREST PATCHES ≥0.8 HECTARES

Kanata Golf and Country Club Redevelopment
Combined Environmental Impact Statement and Tree Conservation Report



Please Note: This is not a legal land survey. All dimensions and locations are shown as approximate. Only Ecological Land Classification (ELC) Forest Communities are shown. Thicket communities and tree stands are shown on Figures 3 to 8.

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3.3.2 Significant Woodlot Assessment – Woodlot Ages (TCR)

Historic air photos made available by the City of Ottawa (2019) and NRCAN (2019) were utilized to determine the likely age of forest within each of the forest patches ≥0.8 ha in size. The historic air photos from 1976 are approximately 43 years old, whereas the historic air photo from July 1959 is approximately 60 years old and most closely matches the 60 year age criteria. The historic air photos are shown below.

Although isolated trees and shrubs appear to be present in 1976, the majority of the area that is currently occupied by Woodlot A and Woodlot B is devoid of tree and shrub cover in 1976. This suggests that the majority of trees within Woodlot A and Woodlot B are less than approximately 40 years of age, and hence do not meet the 60 year age criteria. Trees older than 40 years of age within Woodlot A and Woodlot B are likely to be limited to a few isolated stems.

In 1976 and also in July 1959, tree and/or shrub cover is visible throughout the majority of the area that is currently occupied by Woodlot C and Woodlot D. This suggests that the majority of trees within Woodlot C and Woodlot D are older than 60 years of age. In 1976, very young tree and/or shrub cover is visible in the area that is currently occupied by the southern portion of Woodlot E. The area that is currently occupied by the northern portion of Woodlot E appears largely devoid of tree and shrub cover in 1976. In July 1959, tree and shrub cover is again visible in the area that is currently occupied by the southern portion of Woodlot E, whereas the northern portion of Woodlot E appears largely devoid of tree and shrub cover. This suggests that trees in the southern portion of Woodlot E are older than 60 years of age, whereas trees in the northern portion of Woodlot E are likely younger than 40 years of age.

Of the five (5) forest patches ≥0.8 ha in size, three (3) appear to include significant forest cover that is ≥60 years of age (Woodlots C, D and E). Therefore, there are three (3) forest patches within the Site which qualify as potential Significant Woodlots under the amended City of Ottawa criteria for the urban area. Woodlots C, D and E are shown below in Figure 11.

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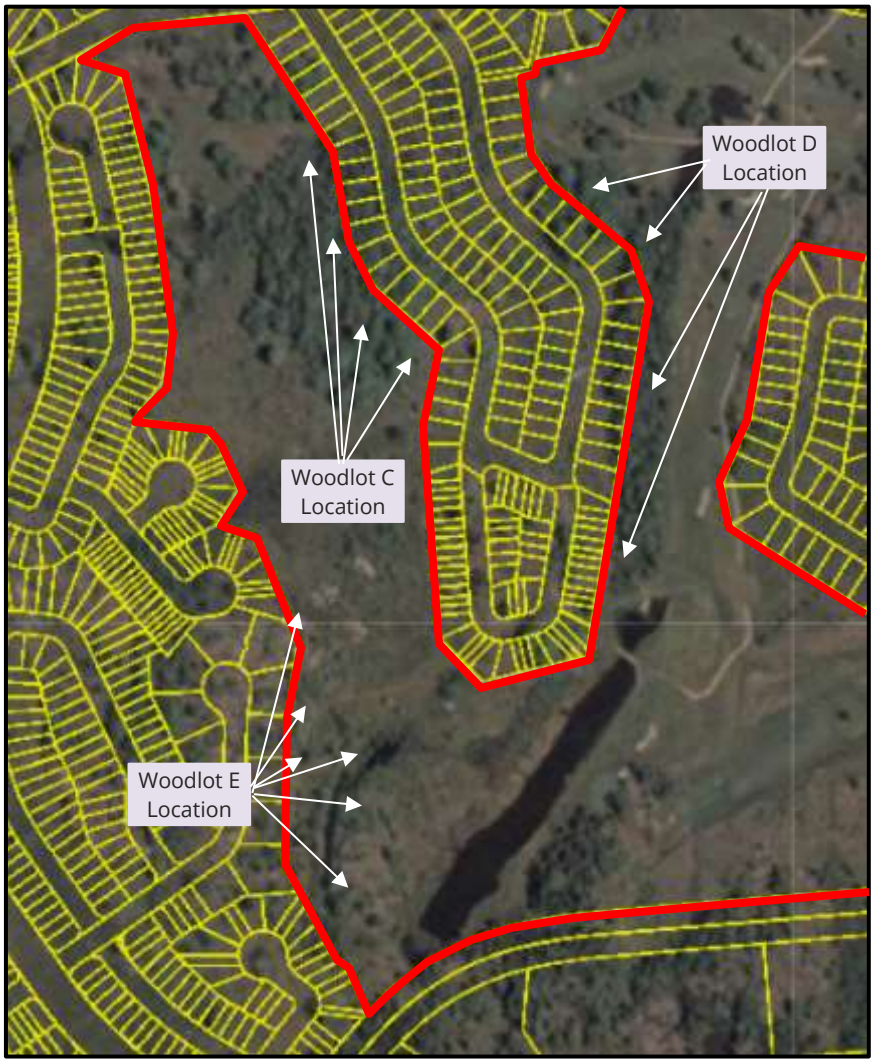
Historic Air Photograph 1: Historic Air Photo from 1976 (Site limits shown in red). Note that although isolated trees and shrubs appear to be present in 1976, the majority of the area that is currently occupied by Woodlot A and Woodlot B is devoid of tree and shrub cover in 1976. This suggests that the majority of trees within Woodlot A and Woodlot B are less than approximately 40 years old (Photo from City of Ottawa 2019).



Historic Air Photograph 2: Historic Air Photo from 1976 (Site limits shown in red). Note that tree and/or shrub cover is visible throughout the majority of the area that is currently occupied by Woodlot C and Woodlot D. This suggests that the majority of trees within Woodlot C and Woodlot D are older than 40 years (refer to the July 1959 air photo below). Very young tree and/or shrub cover is visible in the area that is currently occupied by the southern portion of Woodlot E. The area that is currently occupied by the northern portion of Woodlot E appears largely devoid of tree and shrub cover. This suggests that trees in the southern portion of Woodlot E are older than 40 years of age (refer to the July 1959 air photo below), whereas trees in the northern portion of Woodlot E are likely younger than 40 years of age (Photo from City of Ottawa 2019).

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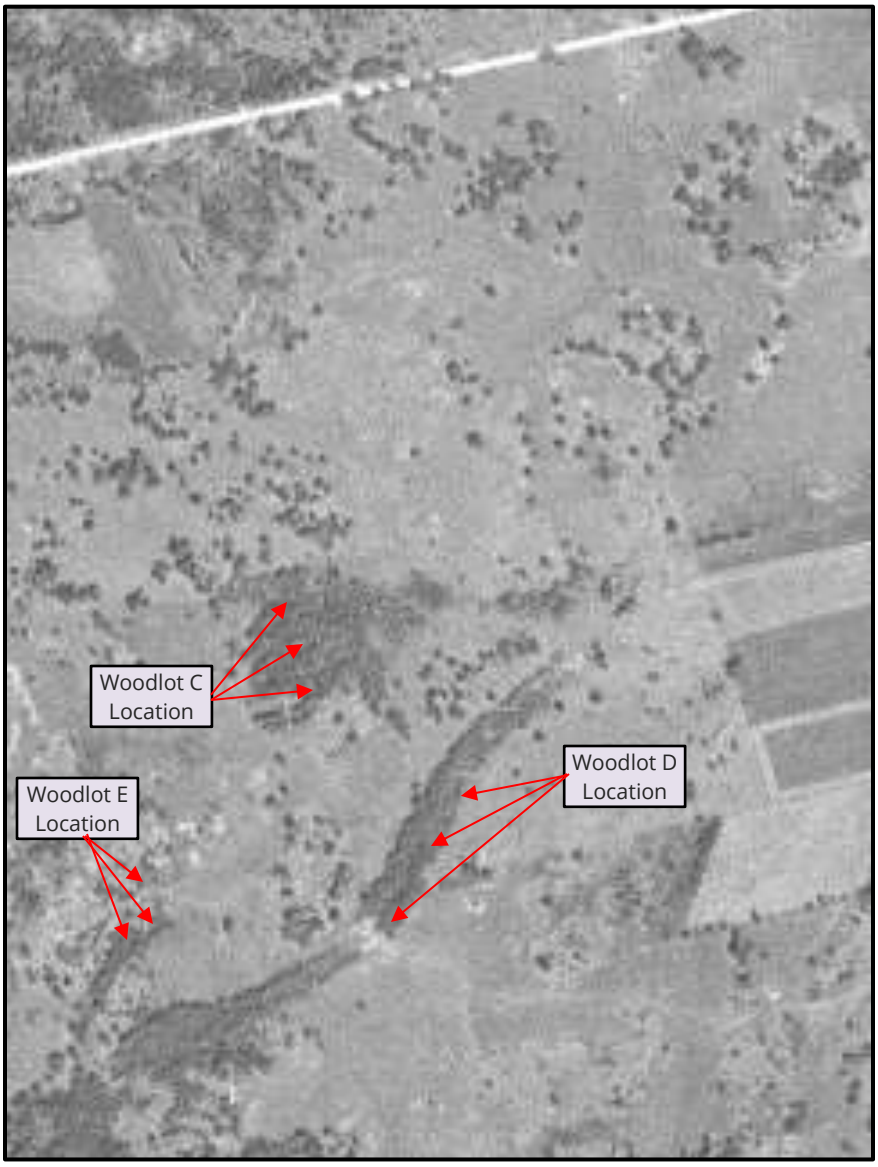

Historic Air Photograph 3: Historic Air Photo from July 1959. Note that tree and/or shrub cover is visible throughout the majority of the area that is currently occupied by Woodlot C and Woodlot D. This suggests that the majority of trees within Woodlot C and Woodlot D are older than 60 years. Tree and/or shrub cover is visible in the area that is currently occupied by the southern portion of Woodlot E. The area that is currently occupied by the northern portion of Woodlot E appears largely devoid of tree and shrub cover. This suggests that trees in the southern portion of Woodlot E are older than 60 years of age, whereas trees in the northern portion of Woodlot E are likely younger than 40 years of age (Photo from NRCAN 2019).

FIGURE 11: POTENTIAL SIGNIFICANT WOODLOTS

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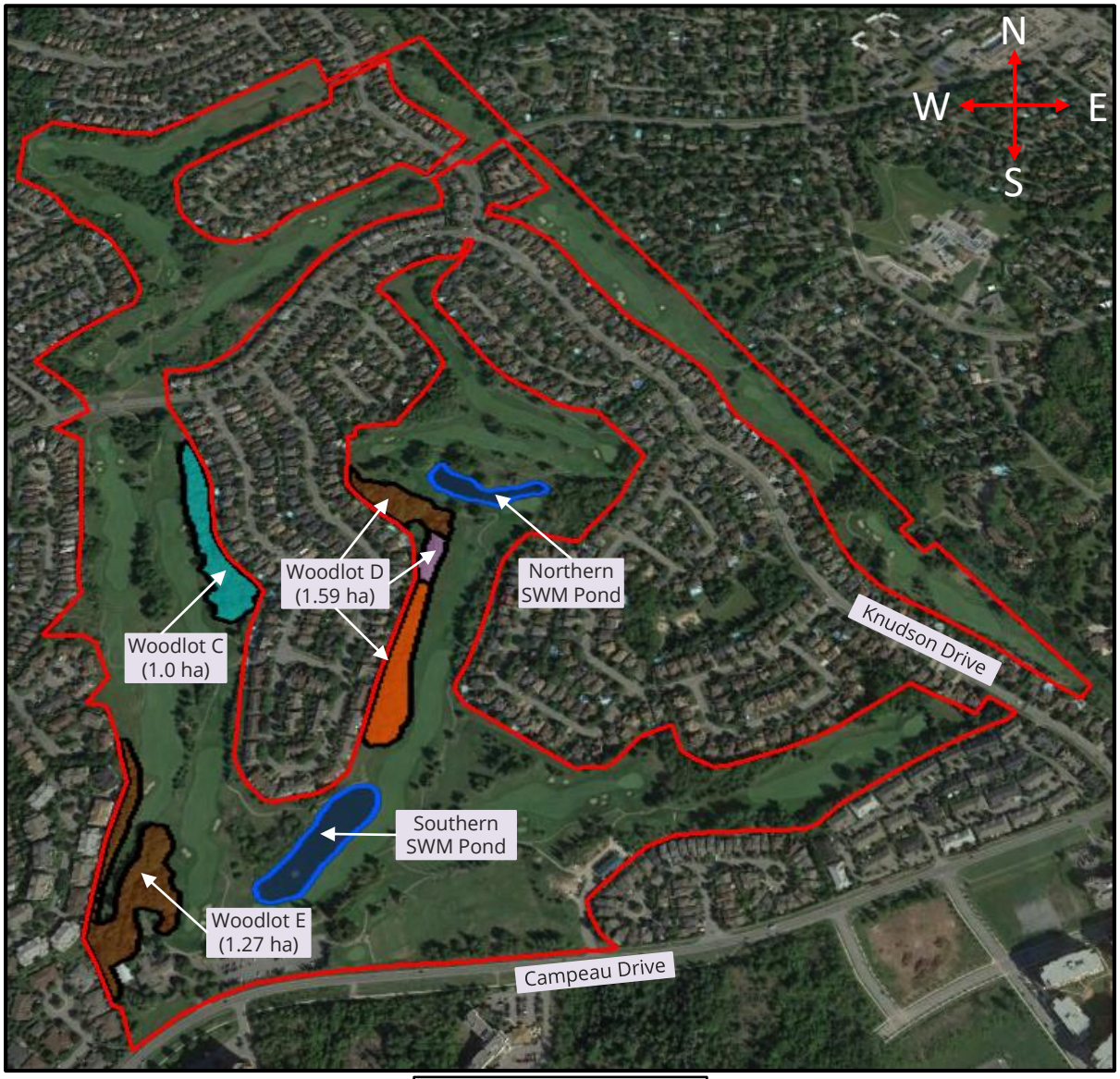

Please Note: This is not a legal land survey. All dimensions and locations are shown as approximate. Potential Significant Woodlots are shown to include those Ecological Land Classification (ELC) Forest Communities which 60 years of age or older and 0.8 ha in size or greater (City of Ottawa – Urban Area Criteria).

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3.3.3 Significant Woodlot Assessment – NHRM Criteria (TCR)

The following is a summary of the *Natural Heritage Reference Manual* (NHRM) Significant Woodlot criteria for the three (3) potential Significant Woodlots that are found within the Site (OMNRF 2010):

- **Woodland Size Criteria** – The Site is within the Ottawa West Minor Watershed, which has approximately 38% forest cover (City of Ottawa 2011). In planning areas with 30-60% forest cover, woodlots 60 ha or larger would qualify under the size criteria. Woodlots C, D and E are approximately 1.0, 1.59 and 1.27 ha in size (respectively). Although the sizes of Woodlots C, D and E are sufficient for these features to qualify under the amended City of Ottawa criteria for the urban area (≥0.8 ha), they are much too small to qualify under the NHRM woodland size criteria.
- **Interior Forest Habitat** – Forested areas 100 m from an opening that is 20 m or greater in size are considered interior forest habitat. Woodlots C, D, and E each occur as relatively thin stands that are present along the edges of the Site. The largest of these features (Woodlot D) is approximately 1.59 ha in size. All three potential Significant Woodlots occur with houses on one side and the golf greens on the other. There are no portions of the potential Significant Woodlots that occur more than 100 m from an opening, and therefore no interior forest habitat is present.
- **Proximity to Other Woodlands/Habitats** – Woodlots within 30 m of another significant feature meet this criteria. As discussed above, the Site is surrounded by existing developed residential properties and/or roads on all sides. Woodlots C, D and E all occur between the existing golf greens and existing developed residential homes. As such, there are no other woodland and/or significant habitats in close proximity.
- **Water Protection** – As discussed below in Section 3.4, the only water features found within the Site include artificial stormwater management ponds and stormwater swales. All of the stormwater management features are fed either by outlet pipes from the adjacent subdivisions and/or by surface runoff from the golf course. There is no direct connection to any natural watercourses or wetlands. Although stormwater management swales pass through Woodlots D and E, the woodlots do not provide a significant water protection function, due to the absence of natural wetlands and watercourses.
- **Linkages** – As noted above, Woodlots C, D and E all occur between existing residential homes and the golf greens. The Site in general is surrounded by existing developed residential properties and/or roads on all sides. As such, Woodlots C, D, and E are not likely to provide a significant linkage function.
- **Woodlot Diversity** – As described above, the plant diversity within Woodlots C, D and E is comparatively low, and the features are dominated by relatively young to moderately aged secondary regrowth forest. Due to their proximity to existing development and landscaping

features, there is relatively low native plant diversity and invasive species are comparatively highly represented. Woodlots C, D and E were not found to contain exceptional plant diversity, and no regionally rare forest plant species were noted.

- **Uncommon Characteristics** – Uncommon forest types, environmental features, or plant communities may contribute to woodlot significance. Also, forest stands older than 100 years would be considered significant. As discussed above in Section 3.3.2, historic air photos indicate that portions of Woodlots C, D and E are older than approximately 60 years of age. However, trees visible in the July 1959 and 1976 historic air photos appear relatively young, which suggests that trees within the woodlots are only likely to be marginally older than 60 years of age (on average). Woodlots C, D and E do not appear to be older than 100 years of age. Woodlots C, D and E are each comprised of common forest types that are relatively abundant as secondary regrowth throughout the region. As such, Woodlots C, D and E do not qualify under the Uncommon Characteristics criteria.
- **Economic and Social** – Woodlots which contribute special economic or social functions can qualify under this criteria. Woodlots C, D and E occur within the City of Ottawa urban area. Within the urban area, the City of Ottawa automatically recognizes woodlots ≥0.8 ha in size and over 60 years of age as qualifying under the social criteria. The social functions provided by Woodlots C, D, and E primarily relate to their position within a golf course and country club property. Within this context, they contribute to the general ability of the Site to provide opportunities for recreation (e.g. sporting activities), they provide aesthetic value, and they provide opportunities for passive recreational enjoyment. Woodlots C and D do not currently have formal or informal trail systems. A portion of the golf course pathway system, which includes a pedestrian bridge, passes through Woodlot E. Woodlots C, D and E all occur adjacent to existing residential properties, and therefore they provide aesthetic value for adjacent residents.

3.3.4 Significant Woodlot Assessment – Summary (TCR)

In summary, the City of Ottawa Significant Woodlot criteria for the urban area defines Significant Woodlots as forest patches that are ≥0.8 ha in size and 40 years of age or older at the time of evaluation. However, the age criteria has recently been revised to include woodlots 60 years of age or older, as a result of a recent Local Planning Appeal Tribunal (LPAT) decision. There are five (5) forest patches within the Site which are ≥0.8 ha in size. Of these, three (3) had significant shrub and/or tree coverage in the July 1959 historic air photo. There are therefore three (3) potential Significant Woodlots within the Site (Woodlots C, D and E).

Woodlots C, D and E are comparatively small secondary growth features that are partially degraded due to their presence adjacent to a golf course and existing residential development. As discussed above, the woodlots do not qualify as Significant Woodlots under any of the *Natural Heritage Reference Manual (NHRM)* Significant Woodlot criteria, with the exception of the social criteria (OMNRF 2010). Therefore, although Woodlots C, D and E have the potential to qualify as Significant Woodlots under the social criteria, they provide comparatively little ecological value and are not recommended to be retained for conservation purposes. Instead, retention and/or mitigation of impacts to Woodlots C, D and E should focus on preserving and/or replacing their social value. Potential impacts to Woodlots C, D and E, along with the proposed extent of tree retention, are discussed in greater detail in Section 4.1.1. Measures to preserve the social functions provided by Woodlots C, D and E are also discussed in Section 4.1.1.

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3.4 Watercourses and Fish Habitat

3.4.1 Stormwater Infiltration Swales

There are six (6) stormwater infiltration/conveyance swales within the Site. All of the stormwater infiltration/conveyance swales were observed to be fed either by outlet pipes from the adjacent residential subdivisions and/or by surface runoff from the golf course. None of the stormwater swales are directly connected to any downstream natural features. Photographs of the stormwater swales, including the outlet pipes that feed them, are included in Appendix A.

Of the six (6) swales, only the swale in the southwest corner of the Site and the swale that connects to the northern stormwater management pond were observed to have significant standing water during the Site surveying. The swale in the southwest corner of the Site occurs in a broad ravine, which is present north of the existing clubhouse. A bridge passes over the ravine, connecting the clubhouse to the adjacent golf greens. The swale passes through Woodlot E, and was observed to be hydrated in the spring and early summer, with surface water up to approximately 50 cm deep. The feature was observed to be dry by late summer. The swale does not appear to have an outlet, and water that is fed into the swale from the adjacent subdivision either evaporates or infiltrates.

The swale that connects to the northern stormwater management pond was also observed to be hydrated in the spring and early summer. Surface water depths up to approximately 50 cm were observed. The swale passes through Woodlot D and is fed by an outlet pipe from the adjacent subdivision. Water within the swale outlets to the adjacent northern stormwater management pond.

The remaining four (4) swales were predominantly dry throughout the surveying period. Within the dry swales, vegetation included Common Cattail and Reed Canary Grass. In the two (2) hydrated swales, vegetation included Common Cattail, Purple Loosestrife, Reed Canary Grass, Spotted Touch Me Not, various sedges, and Sensitive Fern. All of the stormwater management swales are artificial features that are fed either by outlet pipes from the adjacent subdivisions and/or by surface runoff from the golf course. They are too small and artificial in origin to be considered wetlands and have no open upstream or downstream connection to potential natural fish habitat. As such, none of the stormwater swales are considered significant features.

3.4.2 Stormwater Ponds

Photographs of the stormwater management ponds are included in Appendix A. Two (2) stormwater management ponds are located within the Site, both of which are artificial features. The stormwater management ponds predominantly consist of open water, with limited vegetation found growing around the edges. The majority of the pond edges appear to be regularly mowed, thereby limiting the growth of wetland plants. Small patches of wetland vegetation are found along the pond edges, including Yellow Iris, Narrow Leaved Cattail, Common Cattail, and Purple Loosestrife.

3.4.3 Fish Habitat

As discussed above in Section 2.0.3, fish sampling was not deemed to be required, due to the absence of natural wetland and watercourse features. However, the presence of fish within the stormwater management ponds was visually assessed by observing fish from the surface. Invasive Goldfish (Carassius auratus) and invasive Common Carp (Cyprinus carpio) were both observed to be present within the stormwater management ponds. In addition, unidentified minnows were observed, some of which may include individuals of native species. As discussed below in Section 4.4.3, a fish and wildlife salvage plan will be required to relocate fish and other wildlife during the dewatering of the stormwater management ponds. The fish and wildlife salvage plan will be required to include contingencies for the disposal of invasive species (e.g. Goldfish and Common Carp).

Fisheries and Oceans Canada does not require projects that take place within artificial stormwater management ponds to be submitted for review under the Fisheries Act (FOC 2019). Therefore, a review under the Fisheries Act is not required to support the decommissioning of the existing stormwater management ponds and swales.

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3.5 Adjacent Lands and Significant Features

The Site is surrounded on all sides by existing developed residential properties and/or roads. As such, there are no significant natural heritage features found immediately adjacent to the Site. Within the Site, there are no features that are shown as Provincially Significant Wetlands (PSWs), Areas of Natural and Scientific Interest (ANSI), or features that are shown as part of the City of Ottawa Natural Heritage System (City of Ottawa 2014; OMNRF 2019). The only potentially significant features found within the Site are the potential Significant Woodlots, which are discussed above in Section 3.3.

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3.6 Wildlife and Significant Wildlife Habitat

Wildlife and bird species noted during surveys of the Site are listed in Appendix C. Surveying results for Species at Risk (SAR) are discussed below in Section 3.7. The habitat of SAR is considered Significant Wildlife Habitat (SWH). As described below in Section 3.7, no wildlife SAR were noted within the Site.

Breeding bird survey points are shown in Figure 12. A total of forty (40) bird species were noted within the Site during the breeding bird survey. All of the bird species noted within the Site are relatively common species that are frequently found in urban and suburban areas in the Ottawa region. The stormwater management ponds were observed to attract Red Winged Blackbird, Mallard, Great Blue Heron, Canada Goose, Cackling Goose, Black Crowned Night Heron, Double Crested Cormorant, and Swamp Sparrow. The remaining species listed in Appendix C were observed within the forest and thicket patches throughout the Site. No interior forest breeding species, nor avian SAR, were observed within the Site.

Mammals observed within the Site included Common Raccoon, Eastern Grey Squirrel, Red Squirrel, Eastern Cottontail, and Eastern Chipmunk. No reptile species (e.g. no snakes or turtles) were observed within the Site, despite completing detailed basking surveys for turtles (discussed below). Notably, no snakes were observed anywhere within the Site. This suggests that it is unlikely that any snake hibernacula features occur within the Site, as snakes are typically abundant in the spring adjacent to hibernacula features.

The amphibian breeding survey results are summarized below in Table C. Amphibian surveys included both of the hydrated stormwater swales and both stormwater management ponds. As noted in Table C, the only amphibians that were found within the Site were American Bullfrogs and Green Frogs. Both species were observed calling in the stormwater management ponds. The maximum extent of calling was observed on June 25th, when five (5) Green Frogs and two (2) American Bullfrogs were heard calling in the Northern SWM Pond, and three (3) Green Frogs and two (2) American Bullfrogs were heard calling in the Southern SWM Pond. Amphibian calling density was not sufficient for either stormwater management pond to qualify as SWH (OMNRF 2014b). It should also be noted that while both stormwater management ponds house small numbers of breeding amphibians, they are artificial features with limited wetland vegetation.

No stick nests, migratory bird stopover points, wetlands, heron rookeries, caves, bedrock fissures, wetlands, snake hibernacula, or any other features which may qualify as SWH were noted within the Site (OMNRF 2014b).

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TABLE C: AMPHIBIAN SURVEY RESULTS					
Survey Date	**Temperature**	**Conditions**	**Start Time**	**Amphibian Calls**	**Other Species**
April 26th, 2018	11ºC	Clear Skies	8:30 PM	None within Site. Large chorus of Spring Peepers south of Campeau Drive.	None
May 24th, 2018	19ºC	Clear Skies	9:00 PM	No Calling Activity. Green Frogs and American Bullfrogs observed in both SWM ponds.	None
June 25th, 2018	18ºC	Clear Skies	9:45 PM	North SWM Pond - 5x Green Frogs and 2 x American Bullfrogs. South SWM Pond - 3x Green Frogs and 2x American Bullfrogs.	None

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FIGURE 12: BIRD SURVEY POINTS

Kanata Golf and Country Club Redevelopment

Combined Environmental Impact Statement and Tree Conservation Report

Please Note: This is not a legal land survey. All dimensions and locations are shown as approximate.

3.7 Species at Risk

3.7.1 Blanding's Turtle and Snapping Turtle

The *General Habitat Description for Blanding's Turtles* (OMNRF 2014a) recognizes areas of suitable habitat that occur within 2 km of a known Blanding's Turtle sighting as habitat for the species. A population of Blanding's Turtles is known to reside within the Kizell Provincially Significant Wetland Complex and the South March Highlands Provincially Significant Wetland Complex. Portions of both wetland complexes are located north and northwest of the Site, within 2 km of the northern part of the Site. However, the Site is entirely separated from these wetlands by existing residential development. The existing residential development that lies between the Site and the Kizell Provincially Significant Wetland and the South March Highlands Provincially Significant Wetland is sufficiently dense that it is highly unlikely that a Blanding's Turtle could leave the wetlands and successfully travel to the Site.

As noted above in Section 3.4, there are no natural wetland or watercourse features found within the Site. The stormwater swales and stormwater ponds are artificial features with very limited areas of wetland vegetation. Due to their sparse wetland vegetation and their highly artificial and disturbed nature, it is unlikely that the stormwater swales and stormwater ponds are capable of providing suitable habitat for Blanding's Turtle.

However, in an abundance of caution, a basking survey was undertaken within the Site in order to verify if any turtle species are present. The survey results are summarized below in Table D. The survey included the standard five (5) visits required by the OMNRF survey protocol, as well as an additional sixth visit, which was completed in September 2018 to address the potential that turtles may be present prior to the overwintering season. No turtles of any species were observed within the Site during the surveys. This suggests that it is unlikely that any turtles are present within the Site. Blanding's Turtle and Snapping Turtle are therefore unlikely to be a concern for the proposed redevelopment.

TABLE D: BLANDING'S TURTLE SURVEY RESULTS					
Survey Date	**Start Temperature**	**End Temperature**	**Conditions**	**Start Time**	**Turtle Sightings**
April 30th, 2018	19ºC	19ºC	Full Sun	3:00 PM	None
May 8th, 2018	21ºC	20ºC	Full Sun	3:15 PM	None
May 24th, 2018	16ºC	20ºC	Full Sun	8:30 AM	None
June 2nd, 2018	24ºC	24ºC	Full Sun	3:30 PM	None
June 13th, 2018	21ºC	21ºC	Partly Cloudy	1:00 PM	None
September 17th, 2018	24ºC	22ºC	Full Sun	1:00 PM	None

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3.7.2 Eastern Whip Poor Will and Common Nighthawk

The *General Habitat Description for the Eastern Whip Poor Will* (OMNRF 2014e) describes Whip Poor Will breeding habitat as "…open and half treed areas (which) often exhibit a scattered distribution of treed and open space…". Suitable breeding habitats generally consist of a 'mosaic' of open, half treed, and closed conditions (Garlapow 2007). On average, it is estimated that Eastern Whip Poor Will require a minimum of 9 ha of suitable habitat in order to form a breeding territory (OMNRF 2014e). As noted above, the Site generally does not provide the 'mosaic' of open and closed space preferred by Eastern Whip Poor Will. Common Nighthawk can be found nesting in open areas with little ground vegetation such as alvars, shorelines, quarries, rock barrens, and recent burns (SARO 2019). Although they are sometimes found in orchards, urban parks, and along gravel roads, Common Nighthawk more frequently nest in natural areas (SARO 2019).

Eastern Whip Poor Will call surveys were completed to survey the Site for Eastern Whip Poor Will and Common Nighthawk. Eastern Whip Poor Will call survey sites are shown below in Figure 13. The survey results are summarized below in Table E. As outlined below, no evidence of Eastern Whip Poor Will and Common Nighthawk calling was noted during the survey. Eastern Whip Poor Will and Common Nighthawk are therefore unlikely to be a significant concern for the proposed redevelopment.

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TABLE E: WHIP POOR WILL SURVEY RESULTS						
Survey Date	**Temperature**	**Conditions**	**Wind Speed**	**Start Time**	**WPWI Calls**	**Other Species**
May 24th, 2018	19°C	100% Clear	10 kph	9:00 PM	None	WPW 4 - Killdeer
May 31st, 2018	25°C	60% Clear	11 kph	10:00 PM	None	WPW 3 - Green Frogs
June 25th, 2018	18°C	100% Clear	10 kph	9:45 PM	None	WPW 2 - Green Frogs and American Bullfrogs WPW 3 - Green Frogs and American Bullfrogs

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FIGURE 13: WPWI SURVEY POINTS

Kanata Golf and Country Club Redevelopment

Combined Environmental Impact Statement and Tree Conservation Report

- Site Limits
- Whip Poor Will Survey Points

Please Note: This is not a legal land survey. All dimensions and locations are shown as approximate.

3.7.3 Butternut Trees (TCR)

During the vegetation surveys, Butternut Trees were noted in several locations throughout the Site, including in Vegetation Communities A, C and F. The rules and regulations of the Ontario Endangered Species Act (ESA) require the completion of a Butternut Health Assessment (BHA) in order to assess the health status of the Butternut Trees and subsequent regulatory requirements under the Ontario ESA (OMECP 2019). A BHA was completed in June 2019 (Appendix F). The BHA documented the presence of twenty three (23) Category 2 (retainable) Butternut Trees and eleven (11) Category 3 (archiveable) Butternut Trees within the Site. Butternut Tree locations are shown below in Figure 14. Note that no Butternut Trees were encountered in the northern part of the Site. As such, Figure 14 has been zoomed in to show only the southern portion of the Site where Butternuts occur. Potential impacts on Butternut Trees and their habitat, as well as regulatory requirements for Butternut Trees, are summarized below in Section 4.4.1.

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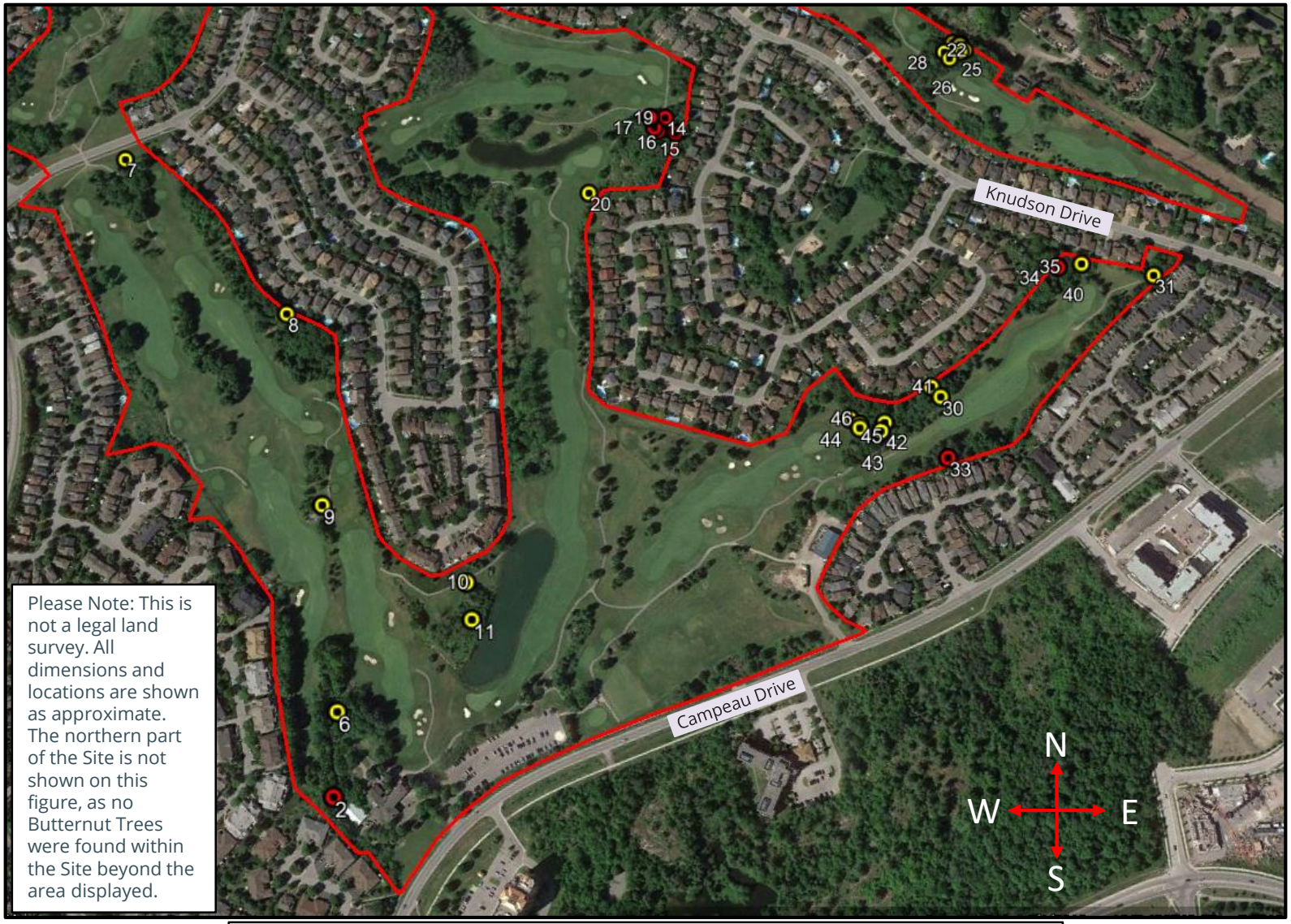
FIGURE 14: BUTTERNUT LOCATIONS

Kanata Golf and Country Club Redevelopment

Combined Environmental Impact Statement and Tree Conservation Report



3.7.4 Additional Species at Risk

The Natural Heritage Information Center (NHIC) records for the nine (9) grids that include and surround the Site were reviewed. This included an area 3 km x 3 km in size and all published Species at Risk (SAR) records were noted (OMNRF 2019). The Ontario Ministry of Natural Resources and Forestry (OMNRF) provided a potential Species at Risk (SAR) list for the Geographic Township of March (Appendix E). In addition to Blanding's Turtle, Snapping Turtle, Eastern Whip Poor Will, Common Nighthawk, and Butternut Trees (discussed above), the following SAR were identified as potentially occurring within the vicinity:

- American Eel – Endangered
- Lake Sturgeon – Threatened
- Hickorynut - Endangered
- American Ginseng - Endangered
- Bank Swallow – Threatened
- Barn Swallow – Threatened
- Chimney Swift – Threatened
- Bobolink and Eastern Meadowlark - Threatened
- Least Bittern - Threatened
- Loggerhead Shrike – Endangered
- Eastern Small Footed Myotis – Endangered
- Little Brown Bat – Endangered
- Northern Long Eared Bat – Endangered
- Tricolored Bat – Endangered
- Rusty Patched Bumblebee – Endangered
- Transverse Lady Beetle - Endangered
- Bald Eagle – Special Concern
- Black Tern – Special Concern
- Horned Grebe – Special Concern
- Canada Warbler – Special Concern
- Eastern Wood Pewee – Special Concern
- Wood Thrush – Special Concern
- Peregrine Falcon – Special Concern
- Rusty Blackbird – Special Concern
- Eastern Musk Turtle – Special Concern
- Northern Map Turtle – Special Concern
- River Redhorse – Special Concern
- Silver Lamprey – Special Concern

- Monarch – Special Concern

The potential for these species to occur within the Site is discussed below:

- **American Eel and Lake Sturgeon:** American Eel and Lake Sturgeon are fish species that are found in association with the Ottawa River (SARO 2019). As described above in Section 3.4, there are no natural wetlands or watercourses within the Site. Therefore, American Eel and Lake Sturgeon are unlikely to be a significant concern for the proposed redevelopment.
- **Hickorynut:** Hickorynut is a freshwater mussel found in association with the Ottawa River (SARO 2019). As described above in Section 3.4, there are no natural wetlands or watercourses within the Site. Therefore, Hickorynut is unlikely to be a significant concern for the proposed redevelopment.
- **American Ginseng:** American Ginseng are found in association with mature Deciduous Forests (SARO 2019). As noted above in Section 3.3, there are several Deciduous Forest vegetation communities within the Site. It should be noted that American Ginseng are exceedingly rare and prone to overharvesting, and are typically only found in Ontario in relatively remote and/or undisturbed forest areas. The forested habitats within the Site are present within an urban area, and are subject to frequent recreational usage. As such, it is relatively unlikely that American Ginseng would be found within the Site. No evidence of American Ginseng was noted within the Site during the plant surveys.
- **Bank Swallows:** Bank Swallows nest in natural and artificial sand and silt deposits with vertical faces (SARO 2019). There are no significant sand or silt deposits with vertical faces within the Site. No Bank Swallows were noted during the breeding bird survey. Bank Swallows are therefore unlikely to be a significant concern for the proposed redevelopment.
- **Barn Swallow and Chimney Swift:** Barn Swallows are found nesting in many anthropogenic structures including old barns, sheds, under bridges, and in large culverts (SARO 2019). Chimney Swifts are found nesting in uncapped stone chimneys (SARO 2019). No Barn Swallows or Chimney Swifts were seen foraging within the Site during the May and June breeding bird surveys. No evidence of Barn Swallow or Chimney Swift nesting was noted within the Site, and therefore neither species is anticipated to be a significant concern for the proposed redevelopment. Four (4) buildings are found within the Site. Building locations are shown in Figure 1. Photographs of the buildings are included in Appendix A. Buildings within the Site include the following:
    - **Building #1:** Building #1 is a maintenance building with metal siding, a metal roof and limited exterior overhangs. The only exterior opening is the garage roll-door, which is closed on a nightly basis. No evidence of Barn Swallow nesting was noted.

  - **Building #2:** Building #2 is also a maintenance building with metal siding, a metal roof and limited exterior overhangs. The only exterior opening is the garage roll-door, which is closed on a nightly basis. No evidence of Barn Swallow nesting was noted.
  - **Building #3:** Building #3 is the pro-shop and clubhouse, which includes a restaurant. Building #3 has numerous overhangs and a patio. However, the building is well maintained and no evidence of Barn Swallow nesting was noted. Building #3 does not have any chimneys.
  - **Building #4:** Building #4 is a small metal supply shed with limited exterior overhangs. No exterior openings were noted. No evidence of Barn Swallow nesting was noted.
- **Bobolink and Eastern Meadowlark:** Bobolink and Eastern Meadowlark can both be found nesting in graminoid dominated fields including natural prairies, fallow agricultural fields, hayfields, and pastures (SARO 2019). The open areas of the Site are dominated by manicured lawn (golf greens) which do not provide potentially suitable habitat for Bobolink and Eastern Meadowlark. No occurrences of Bobolink and/or Eastern Meadowlark were noted during the breeding bird survey. Bobolink and Eastern Meadowlark are therefore unlikely to be a significant concern for the proposed redevelopment.
- **Least Bittern:** Least Bittern breed in open marshes and wetlands. As described above in Section 3.4, the stormwater management ponds do not provide any significant areas of marsh habitat, and emergent vegetation within the ponds is limited to small patches around the pond edges. The extent of habitat provided by the stormwater management ponds is likely insufficient to support Least Bittern, and no evidence of Least Bittern was noted within the Site during the breeding bird surveys. Least Bittern are therefore unlikely to be a significant concern for the proposed redevelopment.
- **Loggerhead Shrike:** Loggerhead Shrike are found nesting in large pastures and grasslands with scattered low trees and thorny shrubs. They also nest and forage in alvars (SARO 2019). As discussed above in Section 3.3, the Site does not provide open pasture, alvar, and/or grassland habitat that is large enough to support Loggerhead Shrike. Therefore, Loggerhead Shrike are not likely to be a significant concern for the proposed redevelopment.
- **Little Brown Bat, Northern Long Eared Bat, Tricolored Bat, Eastern Small Footed Myotis:** No caves, bedrock fissures, mining shafts, abandoned buildings, or other features which may function as bat hibernacula habitat were noted within the Site. The OMNRF (2011b) guidelines for bat surveying are outlined in the *Bats and Bat Habitats: Guidelines for Wind Power Projects*. These guidelines state that deciduous and mixed forest habitats have the potential to provide maternity roosting sites. However, in order to potentially provide significant roost habitat, forest patches generally have to be large enough to provide some interior forest habitat (e.g. forest which is more than 100 m from an existing opening) (OMNRF 2010; OMNRF 2011b). As described in Section 3.3.3, forest cover within the Site primarily occurs either in very small and fragmented

stands, and/or as thin stands that are present along the edges of the Site. The largest woodlot within the Site is approximately 1.59 ha in size and is a long and thin feature (approximately 50 m wide) with houses on one side and the golf greens on the other. There are no forest patches within the Site that are more than 100 m from an opening, and therefore no interior forest habitat exists within the Site. There is therefore negligible habitat within the Site that has the potential to provide bat maternity roost sites, and as such, roosting bats are unlikely to be a significant concern for the proposed redevelopment.

- **Rusty Patched Bumblebee and Transverse Lady Beetle:** Rusty Patched Bumblebee is exceedingly rare in Ontario and the only sightings in the province since 2002 have been at the Pinery Provincial Park on Lake Huron (SARO 2019). There have been no records of Transverse Lady Beetle in Ontario since 1990 (SARO 2019). As such, Rusty Patched Bumblebee and Transverse Lady Beetle are unlikely to be a significant concern for the proposed redevelopment.
- **Bald Eagle:** Bald Eagles are a species of Special Concern, and therefore their habitat is not protected by the Ontario Endangered Species Act (ESA). Bald Eagles are primarily found nesting adjacent to large lakes and rivers (e.g. the Ottawa River) (SARO 2019). Due to the absence of large bodies of water in the vicinity of the Site, Bald Eagles are unlikely to be present. As such, Bald Eagles are unlikely to be a significant concern for the proposed redevelopment.
- **Black Tern and Horned Grebe**: Black Terns build their nests in shallow marshes (SARO 2019). Horned Grebe build their nests in marshes, ponds, and shallow bays (SARO 2019). The wetland vegetation found around the edges of the stormwater management ponds is much too small for Black Terns and/or Horned Grebes to nest. Therefore, Black Terns and Horned Grebes are unlikely to be a significant concern for the proposed redevelopment.
- **Canada Warbler, Eastern Wood Pewee, and Wood Thrush:** Canada Warbler, Eastern Wood Pewee, and Wood Thrush can all be found nesting in deciduous and mixed forests, although Eastern Wood Pewee and Wood Thrush are typically only found breeding in interior forest areas (SARO 2019). As discussed above in Section 3.3.3, there are no areas of interior forest habitat within the Site. No occurrences of Canada Warbler, Eastern Wood Pewee and/or Wood Thrush were documented during the breeding bird survey. As such, Canada Warbler, Eastern Wood Pewee, and Wood Thrush are unlikely to be a significant concern for the proposed redevelopment.
- **Peregrine Falcon:** Peregrine Falcons nest on steep cliff edges and at the top of tall buildings in urban areas (SARO 2019). There are no potentially suitable nest sites for Peregrine Falcons within the Site, and therefore they are unlikely to be a significant concern for the proposed redevelopment.
- **Rusty Blackbird**: Rusty Blackbirds breed in coniferous forest near wetlands (SARO 2019). As discussed above in Section 3.3, there are no areas of coniferous forest within the Site that are large enough to potentially support Rusty Blackbird. No evidence of Rusty Blackbird was noted

during the breeding bird surveys, and therefore Rusty Blackbird are unlikely to be a significant concern for the proposed redevelopment.

- **Eastern Musk Turtle, Northern Map Turtle, River Redhorse, Silver Lamprey**: Eastern Musk Turtle, Northern Map Turtle, River Redhorse, and Silver Lamprey are all species of special concern, and therefore their habitat is not regulated under the Ontario ESA. All four (4) species are primarily riverine species (SARO 2019). Most sightings of these species in the region are associated with the Ottawa River and its major tributaries (SARO 2019). As described above in Section 3.4, there are no natural wetlands or watercourse habitats within the Site. Therefore, Eastern Musk Turtle, Northern Map Turtle, River Redhorse, and Silver Lamprey are unlikely to be a significant concern for the proposed redevelopment.
- **Monarch Butterfly:** Monarch Butterflies are found in association with their Milkweed host plants (SARO 2019). Occurrences of Common Milkweed within the Site were limited to the Deciduous Shrub Thicket (Community B). However, the density of Common Milkweed was not high, and no Monarch Butterflies were noted within the Site during surveying. It should be noted that Monarch Butterflies are a species of special concern, and therefore their habitat is not protected under the Ontario ESA. The wildlife and Species at Risk mitigation measures discussed in Section 4.4.2 will help to mitigate any potential impacts to individual Monarch Butterflies at the construction stage.

3.8 Linkages

As noted above, the Site is surrounded on all sides by existing developed residential properties and/or roads. There are no significant natural heritage features found adjacent to the Site. The Site is therefore unlikely to provide any significant linkage function.

4.0 DESCRIPTION OF ENVIRONMENTAL IMPACTS AND MITIGATION

4.1 Terrestrial Habitat and Tree Removal (TCR)

4.1.1 Significant Woodlot Impacts and Tree Retention (TCR)

As described above in Section 3.3.4, there are three (3) potential Significant Woodlots within the Site (Woodlots C, D and E). Woodlots C, D and E are comparatively small secondary growth features that are partially degraded due to their presence adjacent to a golf course and existing residential development. As discussed in Section 3.3.3, the woodlots do not qualify as Significant Woodlots under any of the *Natural Heritage Reference Manual (NHRM)* Significant Woodlot criteria, with the exception of the social criteria (OMNRF 2010). Therefore, although Woodlots C, D and E have the potential to qualify as Significant Woodlots under the social criteria, they provide comparatively little ecological value and are not recommended to be retained for conservation purposes. Instead, retention and/or mitigation of impacts to Woodlots C, D and E should focus on preserving and/or replacing their social value.

In addition to preserving portions of the potential Significant Woodlots, additional forest patches, landscaping features, and tree stands will be preserved. A tree retention plan is included below. The following is a summary of the recommended tree retention measures:

- Three (3) major park blocks are identified in the Land Use Concept Plan, which collectively provide 4.36 ha of parkland;
- Notably, park block 75 overlaps a portion of potential Significant Woodlot D, thereby providing an opportunity for portions of the feature and its significant functions to be retained. Within the park design, it is recommended that retention of overlapping portions of the potential Significant Woodlot should be prioritized. Wherever feasible, the portions of potential Significant Woodlot D that overlap park block 75 should be retained;
- Park blocks 74 and 76 do not overlap the potential Significant Woodlots. However, existing tree coverage should also be retained within the park design for park blocks 74 and 76, wherever possible;
- The Land Use Concept Plan includes an additional 5.36 ha of open space blocks, which will provide additional opportunities for tree retention. Notably, open space block 87 will preserve a portion of potential Significant Woodlot C, whereas open space blocks 88 and 91 will preserve a portion of potential Significant Woodlot E. Existing tree coverage will be retained within the open space blocks wherever feasible;
- The Land Use Concept Plan includes 3 m wide landscaped buffers around the Site edges adjacent to existing residential properties. The combined size of the 3 m wide landscaped

buffers is 1.7 ha. Many of the Site edges are currently occupied by planted trees, tree stands, or forest patches, and therefore the 3 m wide landscaped buffers will provide additional opportunities for tree retention along the Site edges, including protection of the critical root zones. Existing tree coverage will be retained within the 3 m wide landscaped property buffers wherever feasible;

- There are five (5) new stormwater management blocks, which collectively will occupy approximately 8.02 ha. Tree retention within the stormwater management blocks is not likely to be feasible, due to the required excavation and grade changes. However, it is recommended that tree coverage within the Site should be enhanced by adding new plantings/landscaping features within the stormwater management blocks as part of the Site redevelopment;
- A network of trails has been identified to connect the parkland, open space blocks, and stormwater management blocks. The trails will enhance access to these features, thereby enhancing their ability to provide recreational and aesthetic value; and
- In total, the parkland, open space blocks, 3 m wide landscaped property buffers, and stormwater management blocks account for approximately 27% of the gross area of the Site. Collectively, these communal open space areas will provide opportunities for tree retention and tree planting, while also preserving the recreational and aesthetic values of the Site. Notably, the combination of park and open space blocks provides opportunities to preserve the significant features and functions of the three (3) potential Significant Woodlots.

The social functions provided by Woodlots C, D, and E primarily relate to their position within a golf course and country club property. Within this context, the woodlots contribute to the general ability of the Site to provide opportunities for recreation (e.g. sporting activities), they provide aesthetic value, and they provide opportunities for passive recreational enjoyment. By providing 27% of the gross area of the Site as communal open space areas, the Land Use Concept Plan provides significant opportunities for recreational and aesthetic enjoyment of the Site following redevelopment. The provision of communal open space areas within the Land Use Concept Plan is anticipated to be sufficient to preserve and/or replace the social functions of the potential Significant Woodlots.

More generally, tree retention throughout the Site is provided by the 3 m wide landscaped property buffers and open space blocks, which will mitigate the aesthetic impacts of the redevelopment for adjacent landowners. Together, these areas are 7.06 ha in size. As noted above, it is recommended that additional tree retention should be incorporated into the design of the municipal park blocks, particularly where park block 75 overlaps portions of potential Significant Woodlot D. It is anticipated that ultimately the extent of tree retention, combined with tree planting within the

stormwater management blocks, will be sufficient to mitigate the loss of existing tree coverage associated with the redevelopment.

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Draft Plan of Subdivision - Tree Retention Areas

Portion of Potential Significant Woodlot D

Portion of Potential Significant Woodlot C

Portion of Potential Significant Woodlot E

Tree Retention Recommendations:

GREEN AREAS - 3 m property buffers and open space blocks: Retain existing tree coverage wherever feasible during Site development.

PINK AREAS - Park blocks overlapping potential Significant Woodlots: Within the park design, prioritize retention of overlapping portions of the potential Significant Woodlots. Retain existing portions of the potential Significant Woodlots wherever feasible.

BLUE AREAS - Other Park blocks: Within the park design, retain existing tree coverage if possible.

BROWN AREAS - Stormwater management blocks: Enhance tree coverage during development with new plantings/landscaping features.

SUBJECT TO THE CONDITIONS, IF ANY, SET FORTH IN OUR LETTER DATED ..... 20 .....
THIS DRAFT PLAN IS APPROVED BY THE CITY OF OTTAWA UNDER SECTION 51 OF THE PLANNING ACT.
THIS ..... DAY OF ..... 20 .....

DERRICK MOODIE, MANAGER
DEVELOPMENT REVIEW: WEST
PLANNING, INFRASTRUCTURE AND ECONOMIC DEVELOPMENT DEPARTMENT, CITY OF OTTAWA

KEY PLAN
NTS

DRAFT PLAN OF SUBDIVISION OF

BLOCK 69
REGISTERED PLAN 4M-510,
BLOCKS 126 AND 132
REGISTERED PLAN 4M-651,
PART OF BLOCKS 184 AND 192,
ALL OF BLOCKS 183, 185 AND 186
REGISTERED PLAN 4M-652,
BLOCK 160
REGISTERED PLAN 4M-739,
BLOCK 76
REGISTERED PLAN 4M-741,
PART OF BLOCK 76
REGISTERED PLAN 4M-828,
PART OF BLOCK 1
REGISTERED PLAN 4M-881,
PART OF BLOCK 56 AND
ALL OF BLOCK 55
REGISTERED PLAN 4M-883,
PART OF LOTS 5 AND 6 AND
PART OF THE ROAD ALLOWANCE
BETWEEN LOTS 5 AND 6
(CLOSED BY BY-LAW INST. LT652228)
CONCESSION 3
(GEOGRAPHIC TOWNSHIP OF MARCH)
CITY OF OTTAWA

Scale 1:1500
0 10 20 30 40 50 METRES

METRIC CONVERSION
DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

BEARING NOTE
BEARINGS ARE COMPILED FROM OFFICE RECORDS.

LEGEND:

#	DENOTES	PIN BLOCK 04511
*	-	PIN BLOCK 04512
###	-	PIN BLOCK 04513
DA	-	ZONING

INFORMATION: REQUIRED UNDER SECTION 51 (17) OF THE PLANNING ACT R.S.O. 1990

a. SEE PLAN
b. SEE PLAN
c. SEE PLAN
d. SEE PROPOSED LAND USE SCHEDULE (ABOVE)
e. SEE PLAN
f. SEE PLAN
g. SEE PLAN
h. CITY WATER AVAILABLE
i. SEE SOIL REPORT
j. SEE TOPOGRAPHICAL INFORMATION
k. ALL CITY SERVICES AVAILABLE
l. SUBJECT TO EASEMENTS PER INST. NO.'S LT607362, LT565249, LT569968, LT638339, LT568246, LT568250, LT568251, LT602722, LT1014950, LT607253, LT568247, LT1765034, LT599218, LT599219, LT1011768, LT666335, LT924341, MB1493, TOGETHER WITH LT1022019S

SURVEYOR'S CERTIFICATE
I HEREBY CERTIFY THAT THE BOUNDARIES OF THE SUBJECT LANDS AND THEIR RELATIONSHIP TO ADJOINING LANDS HAVE BEEN ACCURATELY AND CORRECTLY SHOWN.

DATE

BRIAN J. WEBSTER
ONTARIO LAND SURVEYOR

Stantec
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DRAWN: CSC	CHECKED: *	PM: FP	FIELD: *	PROJECT No.: 161413944-131

4.1.2 Tree Preservation Mitigation Measures (TCR)

The following tree mitigation measures should be implemented to help protect and preserve retained trees:

- Wherever feasible, exclude Site grading and excavation activities from designated areas of tree retention;
- Mark the edge of the tree clearing area to ensure only designated trees are removed. Protect the critical root zone (CRZ) of retained trees, where the CRZ is established as being 10 cm from the trunk of a tree for every centimeter of trunk dbh. The CRZ is calculated as dbh x 10 cm;
- When trees to be removed overlap with the CRZ of trees to be retained, cut roots at the edge of the CRZ and grind down stumps after tree removal. Do not pull out stumps. Ensure there is not root pulling or disturbance of the ground within the CRZ;
- If roots must be cut, roots 20 mm or larger should be cut at right angles with clean, sharp horticultural tools without tearing, crushing, or pulling;
- Do not place any material or equipment within the CRZ of any tree;
- Do not attach any signs, notices, or posters to any tree;
- Do not damage the root system, trunk, or branches of any retained tree. Branches that extend into the work area are to be pruned by a qualified arborist before site alteration begins, wherever required in order to avoid damage to the trees; and
- Ensure that exhaust fumes from all equipment are directed away from any tree canopy.

4.1.3 Transplanting and Replanting (TCR)

In order to mitigate the loss of woody vegetation from Site clearing, trees and shrubs will be replanted selectively between lots, at the back and front of lots, and along roadways. In addition, there are five (5) new stormwater management blocks, which collectively will occupy approximately 8.02 ha. Tree retention within the stormwater management blocks is not likely to be feasible, due to the required excavation and grade changes. However, it is recommended that tree coverage within the Site should be enhanced by adding new plantings/landscaping features within the stormwater management blocks as part of the Site redevelopment.

The planting locations and specific planting requirements will be confirmed by a detailed Landscaping Plan. Plantings should emphasize the use of native trees and shrubs, which may include those identified in Appendix B. Planting of Ash trees should be avoided due to the high likelihood that any planted Ash trees will become infested with Emerald Ash Borer.

4.2 Watercourses and Aquatic Habitats

4.2.1 Removal of Stormwater Swales and Ponds

As discussed above in Section 3.4, there are no natural watercourses or wetland habitats within the Site. There are two (2) stormwater management ponds and six (6) stormwater infiltration/conveyance swales within the Site. As described above in Section 3.4, all of the existing stormwater management features are artificial features with little habitat value. All of the existing stormwater management features are fed by outlet pipes from the adjacent subdivisions and/or by surface runoff from the golf course. There is no direct upstream or downstream connection to natural watercourses or wetlands. The existing stormwater management features will be decommissioned during Site redevelopment. Due to their artificial and degraded condition, removal of the existing stormwater management features is not considered a significant impact to the natural features and functions of the Site.

4.2.2 Servicing and Stormwater Management

Stormwater servicing will be provided by five (5) new stormwater management blocks, which collectively will occupy approximately 8.02 ha. The new stormwater management ponds are designed to outlet to buried servicing piping, which will convey water to the Beaver Pond. The Beaver Pond is located approximately 460 m north of the proposed redevelopment. The Beaver Pond is a licensed inline stormwater management facility, which outlets to the Kizell Drain. The Kizell Drain is a tributary of Watt's Creek. Watt's Creek ultimately flows to Shirley's Bay along the Ottawa River. The Site will also receive municipal sewer and water. The stormwater management and servicing studies will consider Low Impact Development (LID) options, in order to mitigate potential impacts to the water balance of the Site.

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4.2.3 Sediment and Erosion Controls

Due to the fact that the existing stormwater management features are scheduled to be decommissioned, sediment and erosion controls are not required to protect these features during redevelopment. However, during construction existing conveyance systems along Knudson Drive, Campeau Drive and other surrounding roads could be exposed to significant sediment loading. Although construction is only a temporary situation, a sediment and erosion control plan will be required to ensure the existing conveyance systems are not negatively impacted by sediment and erosion.

The sediment and erosion control plan will include the following:

- Groundwater in trenches (if present) will be pumped into a filter mechanism, such as a trap made up of geotextile filters and straw, prior to release to the environment;
- Bulkhead barriers will be installed at the nearest downstream manhole in each sewer which connects to an existing downstream sewer (e.g. existing sewers along Knudson Drive, Campeau Drive, and other roads, if required). These bulkheads will trap any sediment carrying flows, thus preventing any construction-related contamination of existing sewers;
- Seepage barriers will be constructed in any temporary drainage ditches;
- Construction vehicles will leave the Site at designated locations. Exits will consist of a bed of granular material, in order to minimize the tracking of mud off-site;
- Any stockpiled material will be properly managed to prevent those materials from entering the sewer systems; and
- Until landscaped areas are sodded or until streets are asphalted and curbed, all catch basins and manholes will be constructed with a geotextile filter sock located between the structure frame and cover.

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4.3 Adjacent Lands and Significant Features

As noted above in Section 3.5, the Site is surrounded on all sides by existing developed residential properties and/or roads. As such, there are no significant natural heritage features found immediately adjacent to the Site. Mitigation measures to protect retained trees on adjacent properties are discussed above in Section 4.1.2.

4.4 Wildlife and Species at Risk

4.4.1 Butternut Tree Regulatory Requirements (TCR)

As discussed above in Section 3.7.3, the rules and regulations of the Ontario Endangered Species Act (ESA) require the completion of a Butternut Health Assessment (BHA) in order to assess the health status of the Butternut Trees and subsequent regulatory requirements under the Ontario ESA (OMECP 2019). A BHA was completed in June 2019 (Appendix F). The BHA documented the presence of twenty three (23) Category 2 (retainable) Butternut Trees and eleven (11) Category 3 (archiveable) Butternut Trees within the Site. The rules and regulations of the Ontario ESA establish a 25 m buffer zone surrounding Category 2 and 3 Butternut Trees. Activities that may negatively affect a Butternut Tree are considered an 'impact' to that tree if they take place within 25 m of the tree (OMECP 2019). Butternut habitat is defined as the area within 50 m of a Category 2 or 3 Butternut Tree. It is anticipated that the redevelopment will result in the removal and/or impacts to multiple Category 2 and 3 Butternut Trees, as well as the removal of Butternut habitat. However, it should be noted that Open Space Block 82 includes seven (7) of the eleven (11) Category 3 trees. As such, the potential exists for up to seven (7) of the Category 3 Butternut Trees to be retained within Open Space Block 82. Additional opportunities to retain individual Category 2 Butternut Trees within Open Space Blocks 82, 84, 87, and 90 have also been noted.

Due to the anticipated impacts to Butternut Trees and their habitat, it is anticipated that an Overall Benefit Permit under Clause 17(2)(c) of the Ontario ESA will be required to support the redevelopment. During the Overall Benefit Permit process, potential impacts to Butternut Trees and their habitat will be documented in greater detail, and opportunities for retention and/or protection of Butternut Trees will be further investigated. Where feasible, the Category 2 and 3 Butternut Trees that occur within Open Space Blocks 82, 84, 87, and 90 will be retained.

4.4.2 Wildlife Construction Stage Mitigation - Terrestrial

Potential impacts to wildlife at the construction stage may include the following:

- Removal of habitat features and displacement of wildlife from existing habitat areas;
- Potential injury or mortality of adults in terrestrial habitats due to vehicle impacts, during excavations, or during land clearing; and
- Interruption of movement to essential foraging, breeding, or overwintering areas due to site hoarding or sediment and erosion control fencing.

Mitigation for SAR and wildlife during construction is summarized here. These recommendations include provisions from the City of Ottawa (2015) *Protocol for Wildlife Protection During Construction*:

- **Pre-Stressing:** Prior to vegetation removal, the area should be pre-stressed by traversing the Site with a loud noise such as an excavator horn. This will encourage wildlife to leave the area;
- **Tree Clearing Direction:** Trees should be cleared towards the retained open space blocks and/or areas of tree retention within the municipal park blocks, in order to provide an opportunity for wildlife to leave the work area;
- **Temporary Exclusion Fencing:** Due to the absence of wetland and/or watercourse features, temporary wildlife exclusion fencing at the construction stage should not be required. Following decommissioning of the stormwater management ponds, the risk of frogs and other wildlife entering the Site is anticipated to be negligible;
- **Sweeps:** Prior to vegetation clearing, preconstruction sweeps of vegetated areas will be undertaken by a designated staff member. A designated staff member will be required to conduct daily sweeps each morning prior to the commencement of work to ensure that wildlife have not entered the work area;
- **Vehicle Operation:** Vehicles and equipment are to be operated on Construction Travelways (e.g. roads within the Site) at a speed at which drivers are able to identify wildlife and stop safely to avoid collisions with wildlife;
- **SAR Encounters:** If Species at Risk (SAR) are encountered in the work area, construction in the vicinity must be stopped immediately and measures must be taken to ensure the SAR is not harmed. The project biologist and the Ontario Ministry of Environment, Climate Change, and Parks (OMECP) must be contacted to discuss how to proceed prior to recommencement of work;
- **General Provisions:** General provisions for Site management include the following:
    - Do not harm, feed, or unnecessarily harass wildlife;
    - Drive slowly and avoid hitting wildlife;
    - Keep the Site tidy and free of garbage and food wastes. Secure all garbage in appropriate sealed containers;

  - Ensure proper Site drainage so that standing water does not accumulate on Site. This will reduce the likelihood that wildlife may enter the Site;
  - Any stockpiles should be properly secured with silt fencing to prevent wildlife from accessing areas of loose fill; and
- **Timing Windows:** The core migratory bird nesting season is defined as April 15th to August 15th each year. Initial vegetation clearing should be undertaken outside of this period. If tree clearing must occur during the core migratory bird nesting season, the tree clearing area must first be surveyed by a Qualified Biologist, in order to verify the absence of nesting migratory birds.

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4.4.3 Wildlife Construction Stage Mitigation - Aquatic

In addition to those mitigation measures outlined above, the following requirements apply during the dewatering and decommissioning of the two (2) stormwater management ponds and any of the stormwater management swales that are hydrated at the time of decommissioning:

- **Dewatering:** All dewatering operations must be supervised by a Qualified Biologist, who must be present during dewatering to relocate fish and other wildlife. Full time supervision by a Qualified Biologist is necessary during initial water draw down;
- **Permits:** Prior to the decommissioning of the existing stormwater management features, a *Wildlife Scientific Collector's Authorization* and *License to Collect Fish for Scientific Purposes* must be obtained from the Ontario Ministry of Natural Resources and Forestry (OMNRF). Relocation sites and detailed fish and wildlife salvage procedures will be identified during the fish and wildlife relocation permit application process;
- **Fish and Wildlife Salvage:** A salvage plan must be in place that will allow for relocation of any fish and other wildlife found within dewatering work areas. In accordance with the dewatering arrangement, the water level in any dewatering work areas must be drawn down to permit safe removal of fish and wildlife. All removal activities will be undertaken before the area is completely dry, in order to avoid aquatic animals being exposed to dry conditions. During water draw down, a mesh net will be in place around any dewatering pumps to ensure that fish will not become entangled in the pumps; and
- **Timing Windows:** The stormwater management ponds and stormwater management swales are not directly connected to any adjacent natural watercourses and/or wetlands. Therefore, timing windows for sensitive in-water work should not apply to the decommissioning of the stormwater management features.

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5.0 CUMULATIVE EFFECTS

Cumulative effects were considered in the design of the mitigation measures outlined in Section 4.0. As described above, the redevelopment of the Site is not anticipated to significantly contribute to the cumulative loss of wetland and/or significant wildlife habitat. Forest cover within the Site occurs in relatively small and fragmented patches, and at the regional scale, redevelopment of the Site will not contribute significantly to the cumulative loss of forest habitat. The potential for the Site redevelopment to contribute to the cumulative loss of local forest cover is addressed by the tree retention and mitigation measures described above in Section 4.1.

The only Species at Risk (SAR) documented within the Site are Butternut Trees. As described above in Section 4.4.1, it is anticipated that an Overall Benefit Permit under Clause 17(2)(c) of the Ontario Endangered Species Act (ESA) will be required to support the redevelopment. The Ontario ESA Overall Benefit Permit process requires that proponents either mitigate all impacts to a species, or that they provide an overall benefit to the species, both of which imply no net loss of habitat functionality. Measures to compensate for impacts to Butternut Trees and their habitat are anticipated to be required to fulfill the requirements of the Overall Benefit Permit process. Compensation requirements will be determined in consultation with the Ontario Ministry of Environment, Climate Change, and Parks (OMECP) as part of the Overall Benefit Permit process.

6.0 MONITORING

Construction stage monitoring requirements are outlined in Section 4.4.2 and 4.4.3 (above). Construction stage monitoring will include pre-construction sweeps to inspect vegetation prior to clearing, daily sweeps by construction staff, and full-time supervision by a Qualified Biologist during dewatering.

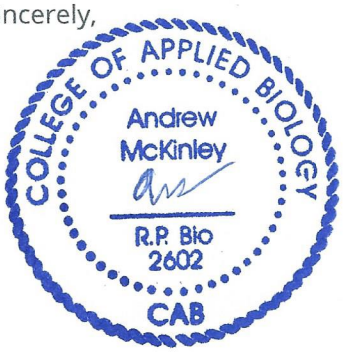
Monitoring requirements related to Butternut Trees will be determined in consultation with the Ontario Ministry of Environment, Climate Change, and Parks (OMECP) as part of the Ontario Endangered Species Act Overall Benefit Permit process.

7.0 CLOSURE

Provided that the regulatory, mitigation, and avoidance measures outlined in this report are implemented appropriately, the redevelopment of the Site is not anticipated to have a significant negative effect on the natural features and functions.

We trust that the above information is sufficient; should you have any questions or require further information, please do not hesitate to contact the undersigned, at your convenience.

Sincerely,



Dr. Andrew McKinley, EP, RP Bio.
Senior Biologist, McKinley Environmental Solutions

Bernie Muncaster, M. Sc.
Principal, Muncaster Environmental Planning Inc.

8.0 REFERENCES

Please note: The Ontario Ministry of Natural Resources and Forestry (OMNRF) has recently transitioned responsibility for the Ontario Endangered Species Act to the Ontario Ministry of Environment, Climate Change and Parks (OMECP). References which continued to be published at the time of report preparation with the OMNRF listed as the author, are attributed to the OMNRF throughout this report. Websites and other references that have recently been relabeled to reference OMECP as the author are instead attributed to OMECP throughout this report.

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APPENDIX A

Site Photographs

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Golf Greens (Refer to Section 3.2.1)

Photograph 1: Golf Green within Section 1 (May 24th, 2018).

Photograph 2: Golf Green within Section 6 (May 24th, 2018).

Landscaping Features (Refer to Section 3.2.2)

Photograph 3: Example of typical tree plantings within Section 1. Plantings of small groups of trees and individual trees are present throughout the Site (June 2nd, 2018).

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Tree Stands and Large Trees (Refer to Section 3.2.3)

Photograph 4: Feature #2 is a 57 cm dbh Bur Oak (June 2nd, 2018).

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Photograph 5: Feature #3 is a stand of Norway Spruce and White Spruce which are between approximately 10 cm to 25 cm dbh in size (June 2nd, 2018).

Photograph 6: Feature #4 is a stand of Manitoba Maples with a dbh between approximately 10 cm to 40 cm. The stand is overgrown with Deciduous Shrub Thicket (June 2nd, 2018).

Photograph 7: Feature #5 is a stand of White Spruce, Norway Spruce, Sugar Maple and White Pine which are between approximately 10 cm and 25 cm dbh (June 2nd, 2018).

Photograph 8: Feature #6 includes a 48 cm and a 47 cm dbh Bitternut Hickory, which are overgrown with Deciduous Shrub Thicket (June 2nd, 2018).

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Photograph 9: Feature #7 includes a 54 cm and a 71 cm dbh Bur Oak (June 2nd, 2018).

Photograph 10: Feature #8 is a 57 cm dbh Bur Oak (far left) (June 2nd, 2018).

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Photograph 11: Feature #9 is a stand of Trembling Aspen up to 20 cm dbh, which is overgrown with Deciduous Shrub Thicket (June 2nd, 2018).

Photograph 12: Feature #10 is a row of approximately twenty (20) White Pine, which vary between approximately 30 cm to 50 cm dbh (June 2nd, 2018).

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Photograph 13: Feature #11 includes a 48 cm and a 64 cm dbh Bur Oak (June 2nd, 2018).

Photograph 14: Feature #12 is a stand of Ironwood and Bur Oak growing around a bedrock outcrop. Trees within the stand vary between approximately 10 cm and 30 cm dbh (June 2nd, 2018).

Photograph 15: Feature #13 is a Weeping Willow with a dbh of over 1 m (June 2nd, 2018).

Photograph 16: Feature #14 is a Deciduous Shrub Thicket dominated by Staghorn Sumac (June 2nd, 2018).

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Photograph 17: Feature #15 is an 84 cm dbh Bur Oak (June 2nd, 2018).

Photograph 18: Feature #16 is a 96 cm dbh Bur Oak (June 2nd, 2018).

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Photograph 19: Feature #17 is a stand of Norway Spruce and Silver Maple, which vary between approximately 10 cm and 30 cm dbh (June 2nd, 2018).

Photograph 20: Feature #18 is a stand of approximately twenty (20) White Pine, which vary between approximately 30 cm and 71 cm dbh. The base of the trees is overgrown with Deciduous Shrub Thicket (June 2nd, 2018).

Photograph 21: Feature #19 is a stand of White Spruce, Norway Spruce, and Bur Oak which vary between approximately 10 cm and 30 cm dbh. The stand is overgrown with Deciduous Shrub Thicket (June 2nd, 2018).

Photograph 22: Feature #20 is an 84 cm dbh Bur Oak (June 2nd, 2018).

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Photograph 23: Feature #21 is a stand of White Cedar that vary between approximately 10 cm and 20 cm dbh (June 2nd, 2018).

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Photograph 24: Feature #22 includes approximately seven (7) White Pine and four (4) White Spruce. One (1) White Spruce is 54 cm dbh in size, whereas the other trees vary between approximately 10 cm and 30 cm dbh (June 2nd, 2018).

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Photograph 25: Feature #23 is a stand of approximately eight (8) White Pine and two (2) Red Pine that vary between approximately 40 cm and 60 cm dbh (June 2nd, 2018).

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Photograph 26: Feature #24 is a mixed stand of Basswood, White Spruce, Manitoba Maple, American Elm and Black Cherry, with stems varying between approximately 10 cm and 30 cm dbh. The stand is overgrown with Deciduous Shrub Thicket (June 2nd, 2018).

Photograph 27: Feature #25 is a Deciduous Shrub Thicket (June 2nd, 2018).

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Photograph 28: Feature #26 is a 57 cm dbh American Elm (June 2nd, 2018).

Photograph 29: Feature #27 is a stand of Basswood, Bur Oak, and Sugar Maple which vary between approximately 10 cm and 25 cm dbh (June 2nd, 2018).

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Photograph 30: Feature #28 is a 97 cm dbh Bur Oak (June 2nd, 2018).

Photograph 31: Feature #29 is a 74 cm dbh Sugar Maple (June 2nd, 2018).

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Photograph 32: Feature #30 is a 56 cm dbh American Elm (June 2nd, 2018).

Photograph 33: Feature #31 includes a 47 cm dbh Sugar Maple and a 65 cm dbh Basswood (June 2nd, 2018).

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Photograph 34: Feature #32 is a 102 cm dbh Silver Maple (June 2nd, 2018).

Photograph 35: Feature #33 includes a 50 cm and a 48 cm dbh Honey Locust (June 2nd, 2018).

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Photograph 36: Feature #34 includes a line of Basswood which are between approximately 40 cm and 60 cm dbh in size. The tree stand is overgrown with Deciduous Shrub Thicket (June 2nd, 2018).

Photograph 37: Feature #35 is a stand of Manitoba Maple up to 20 cm dbh in size, which is overgrown with Deciduous Shrub Thicket (June 2nd, 2018).

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Photograph 38: Feature #36 includes a 53 cm, 48 cm and 54 cm dbh White Pine, and White Cedars between approximately 10 cm and 20 cm dbh (June 2nd, 2018).

Photograph 39: Feature #37 is a stand of White Spruce and White Pine between approximately 30 cm and 40 cm dbh. The stand is overgrown with Deciduous Shrub Thicket (June 2nd, 2018).

Photograph 40: Feature #38 is a dying 68 cm dbh White Ash (June 2nd, 2018).

Photograph 41: Feature #39 is a stand of dead White Ash between approximately 10 cm and 20 cm dbh (June 2nd, 2018).

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Photograph 42: Feature #40 includes six (6) Red Pine and five (5) White Pine between approximately 20 cm and 40 cm dbh (June 2nd, 2018).

Photograph 43: Feature #41 is an 84 cm dbh Bitternut Hickory (June 2nd, 2018).

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Photograph 44: Feature #42 is a stand of White Pine between approximately 40 cm and 60 cm dbh (June 2nd, 2018).

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Photograph 45: Feature #43 is a stand of Trembling Aspen and dead/dying White Ash between approximately 10 cm and 30 cm dbh. Sugar Maple and American Elm are also present. The stand is overgrown with Deciduous Shrub Thicket (June 2nd, 2018).

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Photograph 46: Feature #44 is a stand of Sugar Maple and Domestic Apple with a dbh between approximately 10 cm and 20 cm (June 2nd, 2018).

Photograph 47: Feature #45 is a stand of Red Pine and White Pine with a dbh between approximately 10 cm and 30 cm (June 2nd, 2018).

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Photograph 48: Feature #46 is a stand of White Pine and Sugar Maple between approximately 30 cm and 60 cm dbh (June 2nd, 2018).

Photograph 49: Feature #47 is a stand of Trembling Aspen, Sugar Maple, American Elm, White Ash, and Basswood between approximately 10 cm and 25 cm dbh (June 2nd, 2018).

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Photograph 50: Feature #48 is a stand of White Pine and Sugar Maple between approximately 40 cm and 60 cm dbh. The stand is overgrown with Deciduous Shrub Thicket (June 2nd, 2018).

Photograph 51: Feature #49 is a 76 cm dbh American Elm (June 2nd, 2018).

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Photograph 52: Feature #51 is a 76 cm dbh White Pine (June 2nd, 2018).

Photograph 53: Feature #52 is a 79 cm dbh Sugar Maple (June 2nd, 2018).

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Photograph 54: Feature #53 is a stand of Red Pine and White Spruce between approximately 20 cm and 30 cm dbh (June 2nd, 2018).

Photograph 55: Feature #54 is a 63 cm dbh Silver Maple (June 2nd, 2018).

Photograph 56: Feature #55 is a stand of White Pines between approximately 40 cm and 60 cm dbh. The base of the trees is overgrown with Deciduous Shrub Thicket (June 2nd, 2018).

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Photograph 57: Feature #56 is a stand of Ironwood, White Ash, and Sugar Maple between approximately 10 cm and 30 cm dbh. The stand is overgrown with Deciduous Shrub Thicket (June 2nd, 2018).

Photograph 58: Feature #57 includes a 94 cm and 76 cm dbh Bur Oak (June 2nd, 2018).

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Photograph 59: Feature #58 is a 77 cm dbh Bur Oak (June 2nd, 2018).

Photograph 60: Feature #59 is a stand of Red Oak, Sugar Maple, Basswood, and White Ash between approximately 10 cm and 45 cm dbh (June 2nd, 2018).

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Photograph 61: Feature #60 is a stand of Red Pines between approximately 10 cm and 20 cm dbh (June 2nd, 2018).

Photograph 62: Feature #61 is a stand of Sugar Maples between approximately 20 cm and 40 cm dbh. The stand is overgrown with Deciduous Shrub Thicket (June 2nd, 2018).

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Photograph 63: Feature #62 includes White Pine, Red Pine, Norway Spruce, and White Spruce between approximately 20 cm and 40 cm dbh, which are planted along the edge of the green at the property boundary (June 2nd, 2018).

Photograph 64: Feature #63 is a 92 cm dbh Sugar Maple (left) (June 2nd, 2018).

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Photograph 65: Feature #64 includes a stand of White Pines less than 20 cm dbh (June 2nd, 2018).

Photograph 66: Feature #65 is a Sugar Maple with a dbh of over 1 m (June 2nd, 2018).

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Photograph 67: Feature #66 is a row of large Sugar Maple and Red Oak, which are between approximately 40 cm and 60 cm dbh in size (June 2nd, 2018).

Photograph 68: Feature #67 is a stand of Sugar Maples approximately 20 cm to 40 cm dbh in size. One (1) large Sugar Maple has a dbh of over 1 m (June 2nd, 2018).

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Photograph 69: Feature #68 includes a 94 cm and a 73 cm dbh Sugar Maple (June 2nd, 2018).

Photograph 70: Feature #69 includes a 46 cm and 52 cm Bur Oak and an 85 cm dbh Red Oak (background, center) (June 2nd, 2018).

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Photograph 71: Feature #70 is a stand of Red Pine, White Pine, Norway Spruce and White Spruce planted along the edge of the green at the property boundary. Trees vary between approximately 20 cm and 30 cm dbh (June 2nd, 2018).

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Photograph 72: Feature #71 is a stand of Trembling Aspen, White Birch, Sugar Maple, White Spruce, American Elm and dead White Ash growing along the edge of the green at the property boundary. Trees vary between approximately 10 cm and 40 cm dbh (June 13th, 2018).

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Photograph 73: Feature #72 includes a 72 cm dbh Sugar Maple and a Sugar Maple with a dbh of over 1 m (June 2nd, 2018).

Photograph 74: Feature #73 is a stand of White Spruce between approximately 40 cm and 60 cm dbh (June 2nd, 2018).

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Photograph 75: Feature #74 includes several stands of White Spruce, Norway Spruce, Red Pine and White Pine, which are planted in several locations along the greens and along the property line in the northern part of Section #5. Trees vary between approximately 20 cm and 60 cm dbh (June 2nd, 2018).

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Photograph 76: Feature #75 includes three (3) Sugar Maples, each of which have a dbh of over 1 m (June 2nd, 2018).

Photograph 77: Feature #77 is a Sugar Maple with a dbh of over 1 m (June 2nd, 2018).

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Photograph 78: Feature #78 includes a 68 cm and a 90 cm dbh Bur Oak (June 2nd, 2018).

Photograph 79: Feature #79 includes a 76 cm Bur Oak, a Bur Oak with a dbh of over 1 m, two (2) Silver Maples with a dbh of over 1 m, and two (2) Silver Maples with multiple stems measuring 71 cm, 38 cm, 37 cm, 35 cm, and 43 cm dbh (June 2nd, 2018).

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Photograph 80: Feature #80 includes a stand of Sugar Maples between approximately 10 cm and 40 cm dbh in size. An 84 cm dbh Sugar Maple is present within the stand (center) (June 2nd, 2018).

Photograph 81: Feature #81 is a stand of Sugar Maples, White Cedar, and White Spruce between approximately 20 cm and 40 cm dbh (June 2nd, 2018).

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Photograph 82: Feature #83 includes a 71 cm dbh Silver Maple and a Silver Maple with a dbh of over 1 m (June 2nd, 2018).

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Photograph 83: Feature #84 includes several stands of planted White Spruce, Norway Spruce, Sugar Maple, Red Pine, White Pine, Scots Pine, and White Cedar between approximately 20 cm and 60 cm dbh. The tree stands are planted in several clusters around the golf greens in Section #6 (June 2nd, 2018).

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Photograph 84: Feature #84 includes several stands of planted White Spruce, Norway Spruce, Sugar Maple, Red Pine, White Pine, Scots Pine, and White Cedar between approximately 20 cm and 60 cm dbh. The tree stands are planted in several clusters around the golf greens in Section #6 (June 2nd, 2018).

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Photograph 85: Feature #85 is a stand of White Spruce and White Pine between approximately 20 cm and 40 cm dbh (June 2nd, 2018).

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Photograph 86: Feature #86 includes a stand of young Bur Oak, Trembling Aspen, Basswood and White Ash between approximately 10 cm and 30 cm dbh. The stand is overgrown with Deciduous Shrub Thicket (June 2nd, 2018).

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Photograph 87: Feature #87 includes a stand of White Cedar, Trembling Aspen, Ironwood, American Elm and Staghorn Sumac between approximately 10 cm and 40 cm dbh. The stand is overgrown with Deciduous Shrub Thicket (June 2nd, 2018).

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Photograph 88: Feature #88 is a stand of White Spruce and White Pine planted adjacent to the parking lot. Trees vary in size between approximately 20 cm and 40 cm dbh (June 2nd, 2018).

Photograph 89: Feature #89 includes a row of planted Silver Maples adjacent to the parking lot. Trees vary in size between approximately 20 cm and 40 cm dbh (June 2nd, 2018).

Photograph 90: Feature #90 includes Silver Maples, Sugar Maples, White Pine, Norway Spruce and White Spruce planted around the clubhouse. Trees vary in size between approximately 20 cm and 40 cm dbh (June 2nd, 2018).

Photograph 91: Feature #93 includes three (3) large Bur Oaks and three (3) large Sugar Maples, each between approximately 60 cm and 90 cm dbh (June 2nd, 2018).

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Photograph 92: Feature #94 is a 76 cm dbh Basswood (June 13th, 2018).

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Forest and Thicket Communities (Refer to Section 3.2.4)

Photograph 93: Dry-Fresh Sugar Maple – Basswood Deciduous Forest (Community A) within Section #1 (June 2nd, 2018).

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Photograph 94: Dry-Fresh Sugar Maple – Basswood Deciduous Forest (Community A) within Section #1 (June 2nd, 2018).

Photograph 95: Dry-Fresh Sugar Maple – Basswood Deciduous Forest (Community A) within Section #3 (June 2nd, 2018).

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Photograph 96: Dry-Fresh Sugar Maple – Basswood Deciduous Forest (Community A) within Section #5 (June 2nd, 2018).

Photograph 97: Deciduous Shrub Thicket (Community B) within Section #3 (June 2nd, 2018).

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Photograph 98: Deciduous Shrub Thicket (Community B) within Section #6 (June 2nd, 2018).

Photograph 99: Fresh-Moist Poplar Deciduous Forest (Community C) within Section #1 (June 2nd, 2018).

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Photograph 100: Dry-Fresh Sugar Maple – Black Cherry Deciduous Forest (Community D) within Section #2 (June 2nd, 2018).

Photograph 101: Dry-Fresh Sugar Maple – Ironwood Deciduous Forest (Community E) within Section #3 (June 2nd, 2018).

Photograph 102: Dry-Fresh Sugar Maple – Ironwood Deciduous Forest (Community E) within Section #3 (June 2nd, 2018).

Photograph 103: Dry-Fresh Sugar Maple – Ironwood Deciduous Forest (Community E) within Section #3 (September 17th, 2018).

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Photograph 104: Fresh-Moist White Spruce – Hardwood Mixed Forest (Community F) within Section #5 (June 13th, 2018).

Photograph 105: Dry-Fresh White Ash – Hardwood Deciduous Forest (Community G) within Section #5 (June 13th, 2018).

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Photograph 106: Silver Maple Mineral Deciduous Swamp (Community H) within Section #5 (June 13th, 2018).

Photograph 107: Silver Maple Mineral Deciduous Swamp (Community H) within Section #5 (September 17th, 2018).

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Stormwater Infiltration Swales (Refer to Section 3.4.1)

Photograph 108: Stormwater Infiltration Swale within Section #5. The Stormwater Infiltration Swale is fed by a pipe from the adjacent subdivision, and the swale outlets to the Northern Stormwater Management Pond (May 24th, 2018).

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Photograph 109: Pipe from the adjacent subdivision that feeds water into the Stormwater Infiltration Swale within Section #5 (May 24th, 2018).

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Photograph 110: Stormwater Infiltration Swale within Section #6. The Stormwater Infiltration Swale is fed by a pipe from the adjacent subdivision. The Section #6 Stormwater Infiltration Swale has no outlet, and standing water infiltrates/evaporates (May 24th, 2018).

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Photograph 111: Pipe from the adjacent subdivision that feeds water into the Stormwater Infiltration Swale within Section #6 (May 24th, 2018).

Photograph 112: Dry Stormwater Infiltration Swale within Section #3 – no surface water observed (May 24th, 2018).

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Photograph 113: Dry Stormwater Infiltration Swale within Section #3 – no surface water observed (September 17th, 2018).

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Stormwater Ponds (Refer to Section 3.4.2)

Photograph 114: Looking east across the Southern Stormwater Pond (April 30th, 2018).

Photograph 115: Looking east across the Southern Stormwater Pond (September 17th, 2018).

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Photograph 116: Looking east across the Northern Stormwater Pond (May 8th, 2018).

Photograph 117: Looking west across the Northern Stormwater Pond (June 13th, 2018).

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Wildlife and Significant Wildlife Habitat (Refer to Section 3.6)

Photograph 118: American Bullfrog observed within the Southern Stormwater Pond (May 24th, 2018).

Photograph 119: Green Frog observed within the Northern Stormwater Pond (June 2nd, 2018).

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Butternut Trees (Refer to Section 3.7.3)

Photograph 120: Example of a 67 cm dbh Butternut (Feature #1) found within the Site (May 24th, 2018)

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Additional Species at Risk (Refer to Section 3.7.4)

Photograph 121: Looking east at Building #1. The garage door is closed on a nightly basis (May 24th, 2018).

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Photograph 122: Looking north at Building #2. The garage door is closed on a nightly basis (May 24th, 2018).

Photograph 123: Looking west at Building #3 (May 24th, 2018).

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Photograph 124: Looking west at Building #4 (May 24th, 2018).

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APPENDIX B

Master Plant List

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TABLE A: VEGETATION

Common Name	Scientific Name	Provincial S rank	Brunton Significance Ranking for the City of Ottawa (Brunton, 2005)	Vegetation Type
Yellow Iris	Iris pseudacorus	SNA	Rare (Planted)	Aquatic
Narrowleaf Cattail	Typha angustifolia	SNA	Common	Aquatic
Common Cattail	Typha latifolia	S5	Common	Aquatic
Lady Fern	Athyrium filix-femina	S5	Common	Fern
Spinulose Wood Fern	Dryopteris carthusiana	S5	Common	Fern
Sensitive Fern	Onoclea sensibilis	S5	Common	Fern
Bracken fern	Pteridium aquilinum	S5	Common	Fern
Brome Grass	Bromus sp.		n/a	Grass
Reed Canary Grass	Phalaris arundinacea	SE5	Common (locally abundant introduction)	Grass
Timothy	Phleum pratense	SNA	Common	Grass
Downy Yellow Violet	Viola pubescens	S5	Common	Herbaceous
White Baneberry	Actaea pachypoda	S5	Common	Herbaceous
Garlic-mustard	Alliaria petiolata	SNA	Common	Herbaceous
Common Ragweed	Ambrosia artemisiifolia	S5	Common	Herbaceous
Canada Anemone	Anemone canadensis	S5	Common	Herbaceous
Wild Sarsaparilla	Aralia nudicaulis	S5	Common	Herbaceous
Common Burdock	Arctium minus	SNA	Common	Herbaceous
Jack in the Pulpit	Arisaema triphyllum	S5	Common	Herbaceous
Common Milkweed	Asclepias syriaca	S5	Common	Herbaceous
Yellow Rocket	Barbarea vulgaris	SNA	Common	Herbaceous
Canada Thistle	Cirsium arvense	S5	Common	Herbaceous
Bull Thistle	Cirsium vulgare	SNA	Common	Herbaceous
Queen Anne's Lace	Daucus carota	SNA	Common	Herbaceous
Philadelphia Fleabane	Erigeron philadelphicus	S5	Common	Herbaceous
Trout Lily	Erythronium americanum	S5	Common	Herbaceous
Common Strawberry	Fragaria virginiana	S5	Common	Herbaceous
Day Lily	Hemerocallis fulva	SNA	Common	Herbaceous
Spotted Touch Me Not	Impatiens capensis	S5	Common	Herbaceous

Ox-eye Daisy	Leucanthemum vulgare	SNA	Common	Herbaceous
Purple Loosestrife	Lythrum salicaria	SNA	Common (invasive)	Herbaceous
False Solomon's Seal	Maianthemum racemosum	S5	Common	Herbaceous
Wooly Sweet Cicely	Osmorhiza claytoni	S5	Common	Herbaceous
Wild Parsnip	Pastinaca sativa	SNA	Common	Herbaceous
Common Plantain	Plantago major	S5	Common	Herbaceous
Common Buttercup	Ranunculus acris	SNA	Common	Herbaceous
Canada Goldenrod	Solidago canadensis	S5	Common	Herbaceous
New England Aster	Symphyotrichum novae-angliae	S5	Common	Herbaceous
Small White Aster	Symphyotrichum sp.	S5	n/a	Herbaceous
Dandelion	Taraxacum officinale	SNA	Common	Herbaceous
Red Clover	Trifolium pratense	SNA	Common	Herbaceous
White Clover	Trifolium repens	SNA	Common	Herbaceous
White Trillium	Trillium grandiflorum	S5	Common	Herbaceous
Common Mullein	Verbascum thapsus	SNA	Common	Herbaceous
Tufted Vetch	Vicia Cracca	SNA	Common	Herbaceous
Common Blue Violet	Viola sororia	S5	Common	Herbaceous
Alternate Leaved Dogwood	Cornus alternifolia	S5	Common	Shrub
Red Osier Dogwood	Cornus sericea (stolonifesa)	S5	Common	Shrub
Glossy Buckthorn	Frangula alnus	SNA	Common (aggressive invasive)	Shrub
Tartarian honeysuckle	Lonicera tatarica	SNA	Common (aggressive invasive)	Shrub
Choke Cherry	Prunus virginiana	S5	Common	Shrub
Common Buckthorn	Rhamnus cathartica	SNA	Common (aggressive invasive)	Shrub
Prickly Gooseberry	Ribes cynosbati	S5	Common	Shrub
Skunk Currant	Ribes glandulosum	S5	Common	Shrub
Wild Red Raspberry	Rubus idaeus	S5	Common	Shrub
Purple Flowering Raspberry	Rubus odoratus	S5	Common	Shrub
Lilac	Syringa vulgaris	SNA	Common	Shrub
Manitoba Maple	Acer negundo	S5	Common	Tree
Red Maple	Acer rubrum	S5	Common	Tree
Silver Maple	Acer saccharinum	S5	Common	Tree
Sugar Maple	Acer saccharum	S5	Common	Tree

Horse Chestnut	Aesculus hippocastanum	SNA	Rare (Planted)	Tree
White Birch	Betula papyrifera	S5	Common	Tree
Bitternut Hickory	Carya cordiformis	S5	Common	Tree
American Beech	Fagus grandifolia	S4	Common	Tree
Black Ash	Fraxinas nigra	S5	Common	Tree
White Ash	Fraxinus americana	S5	Common	Tree
Green Ash	Fraxinus pennsylvanica	S5	Common	Tree
Honey Locust	Gleditsia triacanthos	S2	n/a	Tree
Butternut	***Juglans cinerea***	***S3***	***Endangered***	***Tree***
Domestic Apple	Malus sylvestris	n/a	Common	Tree
Ironwood	Ostrya Virginiana	S5	Common	Tree
Norwegian Spruce	Picea abies	SNA	n/a	Tree
White Spruce	Picea glauca	S5	Common	Tree
Red Pine	Pinus resinosa	S5	Common	Tree
Eastern White Pine	Pinus strobus	S5	Common	Tree
Scots Pine	Pinus sylvestris	SNA	Rare (frequently planted)	Tree
Large Tooth Aspen	Populus grandidentata	S5	Common	Tree
Trembling Aspen	Populus tremuloides	S5	Common	Tree
Black Cherry	Prunus serotina	S5	Common	Tree
Bur Oak	Quercus macrocarpa	S5	Common	Tree
Red Oak	Quercus rubra	S5	Common	Tree
Staghorn Sumac	Rhus hirta	S5	Common	Tree
Weeping Willow	Salix alba	SNA	Uncommon	Tree
Crack Willow	Salix fragilis	SNA	Common (invasive)	Tree
White Cedar	Thuja occidentalis	S5	Common	Tree
American Basswood	Tilia americana	S5	Common	Tree
American or White Elm	Ulmus americana	S5	Common	Tree
Virginia Creeper	Parthenocissus vitacea	S5	Common	Vine
Dog Strangling Vine	Vincetoxicum rossicum	SNA	Uncommon (locally abundant invasive)	Vine
Riverbank Grape	Vitis riparia	S5	Common	Vine

Provincial ranks (assigned by NHIC)

S5 = Very common within the province with > 1000 occurences, populations or records
S4 = Common within the province with 21 - 1000 occurences, populations or records
S3 = Rare within the province with 6 - 20 occurences, populations or records
SNA = Ranking not available
SE5 = Very common exotic with > 1000 occurences, populations or records within the province
S? = Unranked, or if followed by a ranking, temporarily assigned (eg. S4?)

APPENDIX C

Bird and Wildlife Sightings

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TABLE B: BIRDS	
Common Name	**Scientific Name**
Red-winged Blackbird	Agelaius phoeniceus
Mallard	Anas fulvigula
Great Blue Heron	Ardea herodias
Cedar Waxwing	Bombycilla cedrorum
Canada Goose	Branta canadensis
Cackling Goose	Branta hutchinsii
Northern Cardinal	Cardinalis cardinalis
Killdeer	Charadrius vociferus
Black-billed Cuckoo	Coccyzus erythropthalmus
Northern Flicker	Colaptes auratus
Rock Pigeon	Columba livia
American Crow	Corvus brachyrhynchos
Blue Jay	Cyanocitta cristata
Pileated Woodpecker	Dryocopus pileatus
Gray Catbird	Dumetella carolinensis
Alder Flycatcher	Empidonax alnorum
Common Yellowthroat	Geothlypis trichas
Baltimore Oriole	Icterus galbula
Ring-billed Gull	Larus delawarensis
Swamp Sparrow	Melospiza georgiana
Song Sparrow	Melospiza melodia
Great Crested Flycatcher	Myiarchus crinitus
Black-Crowned Night-Heron	Nycticorax nycticorax
House Sparrow	Passer domesticus
Double-crested Cormorant	Phalacrocorax auritus
Downy Woodpecker	Picoides pubescens
Hairy Woodpecker	Picoides villosus

Black-capped Chickadee	Poecile atricapilla
Common Grackle	Quiscalus quiscula
Eastern Phoebe	Sayornis phoebe
Yellow-rumped Warbler	Setophaga coronata
Yellow Warbler	Setophaga petechia
American Redstart	Setophaga ruticilla
White-breasted Nuthatch	Sitta carolinensis
American Goldfinch	Spinus tristis
Chipping Sparrow	Spizella passerina
European Starling	Sturnus vulgaris
American Robin	Turdus migratorius
Red-eyed Vireo	Vireo olivaceus
Mourning Dove	Zenaida macroura

TABLE C: OTHER WILDLIFE	
Common Name	**Scientific Name**
Common Raccoon	Procyon lotor
Eastern Grey Squirrel	Sciurus carolinensis
Red Squirrel	Sciurus vulgaris
Eastern Cottontail	Sylvilagus floridanus
Eastern Chipmunk	Tamias striatus
American Bullfrog	Lithobates catesbeianus
Green Frog	Lithobates clamitans

APPENDIX D

Significant Woodlot Assessment Terms of Reference

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Minto Communities
180 Kent Street, Suite 200
Ottawa, ON, K1P 0B6

January 10th, 2019

Attn: Beth Henderson, Senior Land Development Manager

RE: Individual Terms of Reference – Significant Woodlot Assessment
Kanata Golf and Country Club Redevelopment

1.0 SITE OVERVIEW AND BACKGROUND

McKinley Environmental Solutions (MES) and Muncaster Environmental Planning (MEP) were retained by Minto Communities on behalf of Clublink Corporation ULC to prepare a Combined Environmental Impact Statement (EIS) and Tree Conservation Report (TCR) to support the proposed redevelopment of the Kanata Golf and Country Club property (the Site). The Site occurs within the developed urban portion of Kanata (Ottawa) and is predominantly surrounded by existing developed residential homes and/or roads on all sides. There are no significant natural heritage features located adjacent to the Site. The Site is approximately 71 ha in size and is irregularly shaped. The Site has been operated as a golf and country club for several decades and is predominantly an artificial landscape which has been maintained to provide golfing facilities. The majority of the surface area of the Site includes manicured golf greens and fairways (e.g. manicured lawns). The Site also includes a variety of native and non-native landscaping features, including many deciduous and coniferous planted trees and tree stands. Natural vegetation communities primarily consist of patches of native deciduous forest and deciduous thickets, which are present principally around the edges of the Site. There are no natural watercourses or wetland habitats within the Site. Two (2) Stormwater Management (SWM) ponds are located within the Site (referred to as the Northern and Southern SWM Ponds). Six (6) stormwater conveyance/infiltration swales are also present within the Site, all of which are fed either by outlet pipes from the adjacent developed subdivisions or by surface run-off from the golf greens. As discussed in greater detail in the Combined EIS and TCR, Butternut Trees (endangered) are known to occur within the Site. No other significant Species at Risk (SAR) concerns have been noted for the Site, however, the Combined EIS and TCR methodology includes detailed surveying for a variety of SAR (see below).

2.0 DESCRIPTION OF UNDERTAKING

The Site is proposed to be redeveloped to include approximately 545 single detached homes, 586 townhomes, and 371 medium density units for a total of approximately 1,502 units. The two (2) existing stormwater management ponds and the existing stormwater management swales are to be decommissioned. Stormwater servicing will be provided by five (5) new stormwater management blocks, which collectively will occupy approximately 8.02 ha. The Site will also receive municipal sewer and water.

3.0 ASSESSMENT METHODS

The City of Ottawa guidelines for Significant Woodlot evaluation require preparation of an Individual Terms of Reference when evaluating potential Significant Woodlots within the urban area. This Individual Terms of Reference has been prepared to support the evaluation of the potential Significant Woodlots within the Site. Ultimately, the detailed assessment methodology and assessment results will be integrated within the Combined EIS and TCR.

The assessment methods to inventory trees and classify plant communities within the Site will include the following:

- Completion of a three (3) season plant inventory to document the occurrence of plants, create a master plant list, and identify and delineate plant communities;
- Classification of forest patches and thickets according to the vegetation communities identified in the Ecological Land Classification (ELC) manual (OMNRF 1998; Lee 2008);
- Completion of a tree inventory including identification of tree species and tree size measurements using tree sampling plots at a minimum density of 1 plot per hectare of forest;
- Inventory of landscaping features, individual trees, and tree stands where stands of trees occur with approximately ten (10) or more stems and/or where individual trees ≥50 cm diameter at breast height (dbh) occur;
- Due to the large number of landscaping features within the Site, smaller tree stands (<10 stems) and individual trees with a dbh <50 cm will be described in general terms, but will not be documented in detail; and
- Documentation of trees ≥50 cm dbh wherever they occur within the Site.

The City of Ottawa Official Plan (Section 2.4.2), as amended by Official Plan Amendment 179, defines Significant Woodlots in the urban area as any forested area ≥0.8 ha in size supporting woodland 40 years of age or older at the time of evaluation. However, the age criteria has recently been revised to include woodlots 60 years of age or older, as a result of a recent Local Planning Appeal Tribunal (LPAT) decision. The Site occurs within the urban area of the City of Ottawa, and therefore the recently

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amended urban area criteria apply. The assessment methods to evaluate the potential presence of Significant Woodlots within the Site, and to describe their significant features and functions, will include the following:

- In order to evaluate the potential presence of Significant Woodlots, vegetation communities within the Site will first be inventoried and classified according to the vegetation communities described in the Ecological Land Classification (ELC) manual (described above);
- Once the presence of forest communities within the Site has been identified, the size of each forest patch will be measured using GIS software. Forest patches ≥0.8 ha in size will be identified and mapped;
- Historic air photos made available by the City of Ottawa and Natural Resources Canada will then be utilized to determine the likely age of forest within each of the forest patches ≥0.8 ha in size. Air photos from 1959 will be utilized to identify woodlots that are 60 years of age or greater; and
- The significant features and functions of any potential Significant Woodlots that qualify under the age and size criteria will further be evaluated and discussed by reviewing the *Natural Heritage Reference Manual* criteria (OMNRF 2010).

Additional surveying that will be completed to support the Combined EIS and TCR, as well as the Significant Woodlot assessment, includes the following:

- Site surveys to assess the potential for habitat of Species at Risk (SAR), wetlands, fish habitat, significant wildlife habitat features, and other significant habitat features to be present;
- Examination of aerial imagery to evaluate landscape features;
- Natural Heritage Information Center (NHIC) database review;
- Obtainment of an updated Potential Species at Risk (SAR) List for the Geographic Township of March from the Ontario Ministry of Natural Resources and Forestry (OMNRF);
- Review of Official Plan designations;
- Review of the background geotechnical report;
- Completion of a Breeding Bird Survey for several avian Species at Risk (SAR), an Amphibian Call Count survey for breeding amphibians, a Basking Survey for Blanding's Turtle (threatened) and Snapping Turtle (special concern), an Eastern Whip Poor Will (threatened) and Common Nighthawk (special concern) Call Survey, a Butternut Health Assessment (BHA) to document the occurrence and health of Butternut Trees, and an assessment of the potential for Bat Maternity Roosting. All SAR and wildlife surveys will be completed following recognized Ontario Ministry of Natural Resources and Forestry (OMNRF) protocols; and
- Detailed aquatic habitat, fish surveys, and/or a Headwaters Drainage Assessment were not deemed to be required, due to the absence of natural wetland and watercourse features.

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4.0 ANTICIPATED TREE RETENTION AND MITIGATON

Tree retention and mitigation recommendations are expected to include the following:

- Three (3) major park blocks are identified in the Land Use Concept Plan, which collectively provide 4.36 ha of parkland;
- Notably, park block 75 overlaps a portion of potential Significant Woodlot D, thereby providing an opportunity for portions of the feature and its significant functions to be retained. Within the park design, it is recommended that retention of overlapping portions of the potential Significant Woodlot should be prioritized. Wherever feasible, the portions of potential Significant Woodlot D that overlap park block 75 should be retained;
- Park blocks 74 and 76 do not overlap the potential Significant Woodlots. However, existing tree coverage should also be retained within the park design for park blocks 74 and 76, wherever possible;
- The Land Use Concept Plan includes an additional 5.36 ha of open space blocks, which will provide additional opportunities for tree retention. Notably, open space block 87 will preserve a portion of potential Significant Woodlot C, whereas open space blocks 88 and 91 will preserve a portion of potential Significant Woodlot E. Existing tree coverage will be retained within the open space blocks wherever feasible;
- The Land Use Concept Plan includes 3 m wide landscaped buffers around the Site edges adjacent to existing residential properties. The combined size of the 3 m wide landscaped buffers is 1.7 ha. Many of the Site edges are currently occupied by planted trees, tree stands, or forest patches, and therefore the 3 m wide landscaped buffers will provide additional opportunities for tree retention along the Site edges, including protection of the critical root zones. Existing tree coverage will be retained within the 3 m wide landscaped property buffers wherever feasible;
- There are five (5) new stormwater management blocks, which collectively will occupy approximately 8.02 ha. Tree retention within the stormwater management blocks is not likely to be feasible, due to the required excavation and grade changes. However, it is recommended that tree coverage within the Site should be enhanced by adding new plantings/landscaping features within the stormwater management blocks as part of the Site redevelopment;
- A network of trails has been identified to connect the parkland, open space blocks, and stormwater management blocks. The trails will enhance access to these features, thereby enhancing their ability to provide recreational and aesthetic value;
- In total, the parkland, open space blocks, 3 m landscaped property buffers, and stormwater management blocks account for approximately 27% of the gross area of the Site. Collectively, these communal open space areas will provide opportunities for tree retention and tree planting, while also preserving the recreational and aesthetic values of the Site. Notably, the combination

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of park and open space blocks provides opportunities to preserve the significant features and functions of the three (3) potential Significant Woodlots;

- The Combined EIS and TCR will include detailed Tree Preservation and Mitigation Measures;
- The Combined EIS and TCR will also include recommendations for tree planting;
- A detailed Landscaping Plan will be prepared to provide planting details (under separate cover);
- The Combined EIS and TCR will describe any regulatory requirements with respect to potential impacts on Butternut Trees (endangered), as well as any other requirements related to the Ontario Endangered Species Act; and
- The Combined EIS and TCR will include detailed Wildlife Construction Stage mitigation measures.

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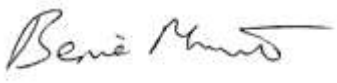
5.0 CLOSURE

The City of Ottawa guidelines for Significant Woodlot evaluation require preparation of an Individual Terms of Reference when evaluating potential Significant Woodlots within the urban area. This Individual Terms of Reference has been prepared to support the evaluation of the potential Significant Woodlots within the Site. Ultimately, the detailed assessment methodology and assessment results will be integrated within the Combined EIS and TCR. Refer to the completed Combined EIS and TCR report for the full Significant Woodlot assessment and conclusions.

We trust that the above information is sufficient; should you have any questions or require further information, please do not hesitate to contact the undersigned, at your convenience.

Sincerely,

Dr. Andrew McKinley, EP, RP Bio.
Senior Biologist, McKinley Environmental Solutions



Bernie Muncaster, M. Sc.
Principal, Muncaster Environmental Planning Inc.

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APPENDIX E

Ontario Ministry of Natural Resources and Forestry (OMNRF) Potential Species at Risk List for the Geographic Township of March

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LONGUEUIL	MARCH	MARLBOROUGH
American Eel	American Eel	American Ginseng
American Ginseng	American Ginseng	Bald Eagle
Bank Swallow	Bald Eagle	Bank Swallow
Barn Swallow	Bank Swallow	Barn Swallow
Black Tern	Barn Swallow	Black Tern
Blanding's Turtle	Black Tern	Blanding's Turtle
Bobolink	Blanding's Turtle	Bobolink
Butternut	Bobolink	Bogbean Buckmoth
Canada Warbler	Butternut	Bridle Shiner
Channel Darter	Canada Warbler	Butternut
Chimney Swift	Chimney Swift	Chimney Swift
Common Nighthawk	Eastern Meadowlark	Common Nighthawk
Cutlip Minnow	Eastern Musk Turtle	Eastern Meadowlark
Eastern Meadowlark	Eastern Small-footed Myotis	Eastern Musk Turtle
Eastern Musk Turtle	Eastern Whip-poor-will	Eastern Prairie Fringed Orchid
Eastern Ribbonsnake	Eastern Wood-pewee	Eastern Small-footed Myotis
Eastern Small-footed Myotis	Hickorynut	Eastern Whip-poor-will
Eastern Wood Pewee	Horned Grebe	Eastern Wood-pewee
Evening Grosbeak	Lake Sturgeon	Grasshopper Sparrow
Golden Eagle	Least Bittern	King Rail
Hickorynut	Little Brown Myotis	Least Bittern
Lake Sturgeon	Loggerhead Shrike	Little Brown Myotis
Least Bittern	Monarch	Loggerhead Shrike
Little Brown Myotis	Northern Map Turtle	Monarch
Monarch	Northern Myotis	Northern Map Turtle
Northern Map Turtle	Peregrine Falcon	Northern Myotis
Northern Myotis	River Redhorse	Red-headed Woodpecker
River Redhorse	Rusty Blackbird	Snapping Turtle
Rusty Blackbird	Rusty-patched Bumble Bee	Spotted Turtle
Short-eared Owl	Silver Lamprey	Tri-colored Bat
Silver Lamprey	Snapping Turtle	Wood Thrush
Snapping Turtle	Transverse Lady Beetle	Yellow Rail
Spotted Turtle	Tri-colored Bat	
Tri-colored Bat	Wood Thrush	
West Virginia White	Yellow-banded Bumblebee	
Whip poor will		
Wood Thrush		

APPENDIX F

Butternut Health Assessment (Rose Fleguel 2019)

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Rosemary Fleguel
405 Latourell Rd.
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Beth Henderson, Senior Land Development Manager
Minto Communities – Canada
200-180 Kent St.
Ottawa, ON
K1P 0B6

June 13, 2019

RE: Kanata Golf & Country Club
BHA Report Number: 002-002
Date(s) of Butternut health assessment: June 7, 8 and 12, 2019

Dear Beth,

This letter is in regard to my assessment of the Butternut trees on the above noted property. Please read this report carefully as it contains important information about the Endangered Species Act, 2007 (ESA).

Best regards,

Rosemary Fleguel
Designated Butternut Health Assessor #002
rosefleguel@gmail.com
613 858 3678

Enclosures:

1. Information from the Ministry of Natural Resources and Forestry about Butternut and the *Endangered Species Act, 2007*
2. Butternut Health Assessor's Report
3. Scanned copied data forms – originals to MECP
4. Electronic and printed copies of the Excel data spreadsheet (BHA Tree Analysis)

Ministry of Natural Resources and Forestry

Species At Risk
P.O. Box 7000, 300 Water Street
Peterborough ON K9J 8M5

Ministère des Richesses naturelles et des Forêts

Espèces en péril
C.P. 7000, 300, rue Water
Peterborough ON K9J 8M5

The enclosed Butternut Health Assessor's Report documents the results of the Butternut health assessment that was conducted by the designated Butternut Health Assessor (BHA) identified in the top section of the report. If there are other Butternut trees (of any size or age) at the site that may be affected by the activity and they are not identified in the enclosed BHA Report, they too must be assessed by a designated BHA.

Butternut is listed as an endangered species on the Species at Risk in Ontario List, and as such, it is protected under the *Endangered Species Act, 2007* (ESA) from being killed, harmed, or removed. If you are planning to undertake an activity that may affect Butternut, you may be eligible to follow the requirements set out in section 23.7 of Ontario Regulation 242/08 under the ESA, or you may need to seek an authorization under the ESA (e.g., a permit).

Please visit e-laws at the link provided below for the legal requirements of eligible activities under section 23.7 of Ontario Regulation 242/08 and conditions that must be fulfilled. Information about Butternut is also available at: http://www.ontario.ca/environment-and-energy/butternut-trees-your-property.

If you are eligible to kill, harm or take Butternut under section 23.7 of the regulation, your first step is to submit the BHA Report and the original data forms enclosed in this package to the local Ministry of Natural Resources and Forestry (MNRF) District Manager. Note that MNRF cannot accept photocopies or scanned electronic copies of the data forms.

Note regarding changes:

If the enclosed BHA Report does not identify which Butternut tree(s) are proposed to be killed, harmed, or taken in Table 1 (i.e., if "unknown" is indicated in the second last column of Table 1), or, if the information in the last two columns of Table 1 has changed since the date this BHA Report was produced, **do not make any edits to the BHA Report**. Instead, please attach a cover letter that identifies which Butternut tree(s) are proposed to be killed, harmed, or taken (by referencing the tree identification numbers) when you submit the enclosed BHA Report to the local MNRF District Manager.

The BHA Report must be submitted at least 30 days prior to registering an eligible activity to kill, harm, or remove a Butternut tree. During this 30 day period, no Butternut trees (of any category) may be killed, harmed, or removed, and MNRF may contact you for an opportunity to examine the trees. If MNRF chooses to examine the trees, a representative of MNRF will contact you using the information you supplied when you submitted the BHA Report.

If you are eligible to follow the rules in regulation under section 23.7, you may register your activity using the "Notice of Butternut Impact" form on the MNRF Registry **after the 30 day period has elapsed**.

If you are **not** eligible to follow the rules in regulation under section 23.7, please contact the local MNRF district office to determine whether you will need to seek an authorization (e.g., a permit). A link to the directory of MNRF offices is provided below.

Note that municipal by-laws and legislation other than the ESA may also be applicable to the removal or harming of trees.

Please retain this information and a copy of the BHA Report (including copies of all data forms) for your records, along with any other documentation you may receive from MNRF should an examination of the trees occur. If you have any questions, please contact your local MNRF district office.

Links:

Endangered Species Act, 2007:
http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_07e06_e.htm

Ontario Regulation 242/08 (refer to section 23.7):
http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_080242_e.htm

MNRF Office Locations:
https://www.ontario.ca/government/ministry-natural-resources-and-forestry-regional-and-district-offices

Butternut Health Assessor's Report Number: 002-002

Rosemary Fleguel
Designated BHA #002
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Beth Henderson, Senior Land Development Manager
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613 782 2311
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Site location: Kanata Golf & Country Club

Date(s) of Butternut health assessment: June 7, 8 and 12, 2019)
Date BHA Report prepared: June 13, 2019

Map datum used: ☒ NAD83 ☐ WGS84'

Total number of trees assessed in this BHA Report: 46

The assessed trees were numbered on site using white paint or white flagging with black marker. The numbers at the site correspond to the tree numbers referenced in this report.

This BHA Report includes the following tables:

- Table 1: Butternut Trees Assessed
- Table 2: Trees Determined by BHA to be Butternut Hybrids
- Table 3: Summary of Assessment Results

Table 1: Butternut Trees Assessed

Tree #	UTM coordinates	Category[1] *(1, 2, or 3[2])*	dbh[3] (cm)	Cultivated? *(Y/N)*	Proposed to be: *(enter one: unknown[4], killed, harmed or taken)*	If tree is proposed to be killed, harmed, or taken, indicate reason tree is proposed to be killed, harmed or taken:

[1] The extent to which the tree is affected by Butternut Canker is presented in the Excel document titled, "BHA Tree Analysis" that accompanies this BHA Report.
[2] Category 3 trees are not eligible to be killed, harmed or taken under section 23.7 of Ontario Regulation 242/08.
[3] dbh: diameter at breast height, rounded to nearest cm (if tree is shorter than breast height, enter zero)
[4] In this column, "unknown" indicates that at the time of assessment, there are no proposals to kill, harm or take this tree that are known to the BHA.

Tree #	UTM coordinates	Category[1] (1, 2, or 3[2])	dbh[3] (cm)	Cultivated? (Y/N)	Proposed to be: (enter one: unknown[4], killed, harmed or taken)	If tree is proposed to be killed, harmed, or taken, indicate reason tree is proposed to be killed, harmed or taken:
1	E0428261 N5018398	1	46	n	unknown	
2	E0428244 N5018371	3	88	N	unknown	
3	E0428238 M5018400	1	27	N	unknown	
4	E0428239 N5018399	1	27	N	unknown	
5	E0428253 N5018394	1	22	N	unknown	
6	E0428266 N5018453	2	57	N	unknown	
7	E0428167 N5019144	2	8	N	unknown	
8	E0428307 N5018900	2	40	N	unknown	
9	E0428298 N5018672	2	6	N	unknown	
10	E0428426 N5018545	2	6	N	unknown	
11	E0428422 N5018505	2	20	N	unknown	
12	E0428781 N5018999	3	56	N	unknown	
13	E0428790 N5018990	3	22	N	unknown	
14	E0428784 N5019013	3	27	N	unknown	
15	E0428771 N5018999	3	35	N	unknown	
16	E0428768 N5019004	3	26	N	unknown	
17	E0428767 N5019019	3	39	N	unknown	
18	E0428764 N5019019	1	37	N	unknown	
19	E0428768 N5019017	3	40	N	unknown	
20	E0428672 N5018945	2	2	N	unknown	
21	E0429167 N5018963	1	7	N	unknown	
22	E0429152 N5018995	2	29	N	unknown	
23	E0429149 N5019004	2	71	N	unknown	
24	E0429150 N5018005	2	29	N	unknown	

Tree #	UTM coordinates	Category[1] (1, 2, or 3[2])	dbh[3] (cm)	Cultivated? (Y/N)	Proposed to be: (enter one: unknown[4], killed, harmed or taken)	If tree is proposed to be killed, harmed, or taken, indicate reason tree is proposed to be killed, harmed or taken:
25	E0429147 N5018995	2	32	N	unknown	
26	E0429131 N5018990	2	32	N	unknown	
27	E0429129 N5018991	1	21	N	unknown	
28	E0429128 N5019000	2	36	N	unknown	
29	E0429142 N5019009	2	31	N	unknown	
30	E0428977 N5018593	2	69	N	unknown	
31	E0429257 N5018659	2	66	N	unknown	
32	E0428968 N5018534	1	40	N	unknown	
33	E0428961 N5018525	3	50	N	Unknown	
34	E0429157 N5018701	3	47	N	unknown	
35	E0429157 N5018700	3	50	N	unknown	
36	E0429166 N5018701	1	26	N	unknown	
37	E0429168 N5018710	1	20	N	unknown	
38	E0429174 N5018708	1	37	N	unknown	
39	E0429183 N5018698	1	21	N	unknown	
40	E0429184 N5018696	2	16	N	unknown	
41	E0428971 N5018607	2	55	N	unknown	
42	E0428908 N5018583	2	26	N	unknown	
43	E0428901 N5018575	2	29	N	unknown	
44	E0428880 N5018585	2	32	N	unknown	
45	E0428881 N5018589	2	61	N	unknown	
46	E0428873 N5018598	2	0	N	unknown	

Table 2: Trees Determined by BHA to be Butternut Hybrids

Tree #	UTM coordinates	Method used (genetic testing or field identification):

Table 3: Summary of Assessment Results

Result:	**Total #:**	**Important information for persons planning activities that may affect Butternut:**
Category 1	12	• A Category 1 tree is one that is affected by butternut canker to such an advanced degree that retaining the tree would not support the protection or recovery of butternut in the area in which the tree is located; and is considered "non-retainable". • During the 30 day period that follows your submission of this BHA Report to the MNRF District Manager, no Butternut trees (of Category 1, 2, or 3) may be killed, harmed, or taken, and MNRF may contact you for an opportunity to examine the trees. • Category 1 trees may be killed, harmed or taken **after** the 30 day period that follows submission of this BHA Report to the MNRF District Manager, unless the results of an MNRF examination indicate that the assessment has not been conducted in accordance with the document entitled "Butternut Assessment Guidelines: Assessment of Butternut Tree Health for the Purposes of the *Endangered Species Act, 2007*".
Category 2	23	• A Category 2 tree is one that is not affected by Butternut Canker, or is affected by Butternut Canker but the degree to which it is affected is not too advanced and retaining the tree could support the protection or recovery of butternut in the area in which the tree is located, and is considered "retainable". • During the 30 day period that follows your submission of this BHA Report to the MNRF District Manager, no Butternut trees (of Category 1, 2, or 3) may be killed, harmed, or taken, and MNRF may contact you for an opportunity to examine the trees. • Activities that may kill, harm or take up to a **maximum of ten (10)** Category 2 trees may be eligible to follow the rules in section 23.7 of Ontario Regulation 242/08, in accordance with the conditions and requirements set out in the regulation. • Refer to e-Laws for the legal requirements of eligible activities under section 23.7 of Ontario Regulation 242/08 and conditions that must be fulfilled: http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_080242_e.htm • Activities that may kill, harm or take more than ten (10) Category 2 trees are not eligible to follow the rules in section 23.7 of Ontario Regulation 242/08. Contact the local MNRF district office for information on how to seek an ESA authorization (e.g., a permit) or consider an alternative that would be eligible for the regulation.
Category 3	11	• A Category 3 tree is one that may be useful in determining sources of resistance to Butternut Canker, and is considered "archivable". • Category 3 trees are not eligible to be killed, harmed or taken under section 23.7 of Ontario Regulation 242/08. • Contact the local MNRF district office for information on how to seek an ESA authorization, or consider an alternative that will avoid killing, harming or taking any Category 3 trees.
Cultivated	0	• An activity that involves killing, harming, or taking a cultivated Butternut tree that was not required to be planted to fulfill a condition of an ESA permit or a condition of a regulation, may be eligible for the exemption provided by subsection 23.7 (11) of O. Reg. 242/08.

Result:	Total #:	Important information for persons planning activities that may affect Butternut:
		• Prior to undertaking the activity, the owner or occupier of the land on which the Butternut is located (or person acting on their behalf) will need to determine whether the exemption for cultivated trees is applicable by determining whether or not the tree was cultivated as a result of the requirements for an exemption under O. Reg. 242/08 or a condition of a permit issued under the ESA. This information can be accessed by contacting the local MNRF district office. • The owner or occupier of the land on which the Butternut is located (or person acting on their behalf) is encouraged to append the details regarding whether the tree was planted to satisfy a requirement (e.g., the permit number or registration number) to this BHA Report for their records.
Hybrid	0	• Hybrid Butternut trees are not protected under the ESA, but their removal may be subject to municipal by-laws and other legislation.

Butternut Health Assessor's Comments:

This concludes the summary of the BHA Report. A complete BHA Report must also include:

1. All original (hard copy) data forms (i.e., all completed sets of Form 1 and Form 2), and
2. Electronic and printed copies of the Excel data analysis spreadsheet.

BHA Tree Analysis (version: December 2013)

This table is to be completed by a designated Butternut Health Assessor (BHA).

BHA Report #	002-002	Assessment Date(s)	June 7, 8 and 12, 2019	Total # Butternut Trees in BHA Report	46
BHA ID #	2	BHA Name	Rosemary Fleguel		
Landowner / Client Name			Minto Canada Inc.		
Property Location			Kanata Golf & Country Club		

input field data										automatic calculations from field data						Categories: 1: non-retainable, 2: retainable, 3: archivable				
			# bole cankers				# root flare (RF) cankers													
Tree #	Live Crown %	Tree dbh (cm)	sooty (S) (will be assigned 2.5 cm per canker)		open (O) (will be assigned 5 cm per canker)				<40 m from cankered tree? (Y or N)	Circ. (cm) = Pi x dbh	total bole canker width (sooty x 2.5 + open x 5)	total RF canker width (sooty x 2.5 + open x 5)	bole canker % of circ.	RF canker % of circ.	total bole & root canker % of 2xCirc	LC% >/= 50 & BC% = 0	LC% >70 & BRC % <20	LC% >70 & BC % <20	Preliminary tree call	FINAL TREE CALL a Cat 2, dbh>20cm <40m from a Cat 1
			S <2 m	S >2 m	O <2 m	O >2 m	RF S	RF O		Circ (cm)	BC (cm)	RC (cm)	BC%	RC%	BRC%					
1	40	46								144.4	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
2	90	88	3	0	1	0	3	5	y	276.3	12.5	32.5	**4.5**	**11.8**	**8.1**	1	2	2	**2**	**3**
3	80	27	3	2	2	1	0	4	y	84.78	27.5	20.0	**32.4**	**23.6**	**28.0**	1	1	1	**1**	**1**
4	0	27								84.78	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
5	0	22								69.08	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
6	90	57	4	0	2	1	1	11	n	179	25.0	57.5	**14.0**	**32.1**	**23.0**	1	1	2	**2**	**2**
7	95	8	0	0	0	0	0	0		25.12	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
8	95	40	0	0	0	0	0	0	n	125.6	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
9	95	6	0	0	0	0	0	0		18.84	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
10	100	6	0	0	0	0	0	0		18.84	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
11	100	20	0	0	0	0	0	1	n	62.8	0.0	5.0	**0.0**	**8.0**	**4.0**	2	2	2	**2**	**2**
12	95	56	1	0	0	0	2	3	y	175.8	2.5	20.0	**1.4**	**11.4**	**6.4**	1	2	2	**2**	**3**
13	90	22	5	1	1	0	0	0	y	69.08	20.0	0.0	**29.0**	**0.0**	**14.5**	1	2	1	**2**	**3**
14	100	27	0	0	0	0	2	0	y	84.78	0.0	5.0	**0.0**	**5.9**	**2.9**	2	2	2	**2**	**3**
15	85	35	3	4	0	0	0	6	y	109.9	17.5	30.0	**15.9**	**27.3**	**21.6**	1	1	2	**2**	**3**
16	90	26	0	0	0	0	0	0	y	81.64	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**3**
17	85	39	2	0	2	0	2	3	y	122.5	15.0	20.0	**12.2**	**16.3**	**14.3**	1	2	2	**2**	**3**
18	85	37	7	1	3	1	2	3	n	116.2	40.0	20.0	**34.4**	**17.2**	**25.8**	1	1	1	**1**	**1**
19	95	40	0	0	0	0	1	0	y	125.6	0.0	2.5	**0.0**	**2.0**	**1.0**	2	2	2	**2**	**3**
20	100	2	0	0	0	0	0	0		6.28	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
21	90	7	2	1	0	0	1	0		21.98	7.5	2.5	**34.1**	**11.4**	**22.7**	1	1	1	**1**	**1**
22	95	29	0	0	1	0	0	1	n	91.06	5.0	5.0	**5.5**	**5.5**	**5.5**	1	2	2	**2**	**2**
23	90	71	4	1	0	0	1	0	n	222.9	12.5	2.5	**5.6**	**1.1**	**3.4**	1	2	2	**2**	**2**
24	95	29	2	0	1	0	2	0	n	91.06	10.0	5.0	**11.0**	**5.5**	**8.2**	1	2	2	**2**	**2**
25	95	32	0	0	0	0	1	0	n	100.5	0.0	2.5	**0.0**	**2.5**	**1.2**	2	2	2	**2**	**2**
26	85	32	5	0	1	0	2	1	n	100.5	17.5	10.0	**17.4**	**10.0**	**13.7**	1	2	2	**2**	**2**
27	80	21	0	0	5	1	0	0	n	65.94	30.0	0.0	**45.5**	**0.0**	**22.7**	1	1	1	**1**	**1**
28	95	36	4	0	0	0	0	0	n	113	10.0	0.0	**8.8**	**0.0**	**4.4**	1	2	2	**2**	**2**
29	95	31	1	1	0	0	1	1	n	97.34	5.0	7.5	**5.1**	**7.7**	**6.4**	1	2	2	**2**	**2**
30	90	69	0	0	0	0	0	0	n	216.7	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
31	95	66	1	1	1	0	4	0	n	207.2	10.0	10.0	**4.8**	**4.8**	**4.8**	1	2	2	**2**	**2**

32	10	40								125.6	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
33	80	50	0	0	0	0	3	0	y	157	0.0	7.5	**0.0**	**4.8**	**2.4**	2	2	2	**2**	**3**
34	80	47	5	4	2	1	1	1	y	147.6	37.5	7.5	**25.4**	**5.1**	**15.2**	1	2	1	**2**	**3**
35	85	50	2	0	1	1	1	1	y	157	15.0	7.5	**9.6**	**4.8**	**7.2**	1	2	2	**2**	**3**
36	20	26								81.64	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
37	0	20								62.8	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
38	30	37								116.2	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
39	90	21	1	0	3	0	1	2		65.94	17.5	12.5	**26.5**	**19.0**	**22.7**	1	1	1	**1**	**1**
40	90	16	2	0	0	1	0	1		50.24	10.0	5.0	**19.9**	**10.0**	**14.9**	1	2	2	**2**	**2**
41	95	55	3	0	1	0	1	5	n	172.7	12.5	27.5	**7.2**	**15.9**	**11.6**	1	2	2	**2**	**2**
42	85	26	0	0	0	0	0	0	n	81.64	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
43	90	29	0	0	0	0	0	0	n	91.06	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
44	90	32	0	0	1	0	0	2	n	100.5	5.0	10.0	**5.0**	**10.0**	**7.5**	1	2	2	**2**	**2**
45	95	61	1	0	0	0	1	1	n	191.5	2.5	7.5	**1.3**	**3.9**	**2.6**	1	2	2	**2**	**2**
46	100	1	0	0	0	0	0	0		3.14	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
47										0	0.0	0.0	**#####**	**#####**	**#####**	####	###	###	**##**	**#DIV/0!**
48										0	0.0	0.0	**#####**	**#####**	**#####**	####	###	###	**##**	**#DIV/0!**
49										0	0.0	0.0	**#####**	**#####**	**#####**	####	###	###	**##**	**#DIV/0!**
50										0	0.0	0.0	**#####**	**#####**	**#####**	####	###	###	**##**	**#DIV/0!**
51										0	0.0	0.0	**#####**	**#####**	**#####**	####	###	###	**##**	**#DIV/0!**
52										0	0.0	0.0	**#####**	**#####**	**#####**	####	###	###	**##**	**#DIV/0!**

0cm 3cm 15cm

Butternut Data Collection Form 1 - 2010 Edition

Surveyor ID or BHA # 002

(PLEASE USE BLOCK LETTERS)

Date (dd/mm/yyyy) 07 - 06 - 2019

Shaded fields are mandatory for Butternut Health Assessments

Surveyor Contact
First ROSEMARY Last FLEGUEL
Email
Telephone (613) 858-3678 Telephone Other ( ) - x

Property Owner *(check if same as surveyor)* ☐
First BETH Last HENDERSON
or Company MINTO COMMUNITIES-CANADA
Email BHENDERSON@MINTO.COM
Telephone (613) 782-2311 Telephone Other ( ) - x

Property Owner's Mailing address
Address 200-180 KENT ST
City OTTAWA
Postal Code K1P0B6 Prov. ON

Tree Location *(if different from mailing address)*
Address/(911#) KANATA GOLF + COUNTRY CLUB
Township Lot Con
City KANATA

Directions

☐ Yes ☐ No Can Share Location Information with other Butternut Recovery Organizations?
☐ Yes ☐ No Site visits OK? (prior arrangments will always be made for a site vist)

> (Greater than)
< (Less than)

Butternut Trees Tally by Diameter Class

(Do a dot tally in blank space; write total# in box for each)

Tree Condition	< 3 cm	3-15 cm	16-30cm	>30 cm
Vigorous: > 50% Live Crown Minor or no cankers				
Poor Vigor: <50% Live Crown or >50% Live Crown + heavily cankered stem				
Dead				

Historically, do some trees produce seeds? ☐ Y ☐ N ☐ Unkown

Estimated area containing butternut for properties > 1 acre (0.4 hectares): ☐ Acres ☐ Hectares

Tree #2 DBHs = 47cm, 50cm, 55cm.
Wb at E0428552 N5018960
E0428757 N5019513 - off property ~5m
Tree #23 DBHs = 52cm, 48cm

Overall Property Description (area(s) containing Butternut)
☐ Rolling Upland ☐ Bottomland
☐ Valley Slope ☐ Variable
☐ Tableland ☐ Unknown

Vegetation Community/ies
☐ Open ☐ Fencerow
☐ Shrubland ☐ Roadside
☐ DeciduousForest ☐ Quary
☐ ConiferForest ☐ UrbanYard
☐ MixedForest ☐ UrbanPark

Other

Soil Drainage
☐ Well Drained
☐ Moderately Drained
☐ Poorly Drained
☐ Unknown

Soil Texture
☐ Clay ☐ Sand
☐ Clay Loam ☐ Variable
☐ Loam ☐ Unknown
☐ Loamy Sand

Soil Depth
☐ > 1metre
☐ 30 - 99cm
☐ < 30cm
☐ Variable
☐ Unknown

Please enter matching numerical page link code on forms 1 and 2

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Butternut Data Collection FORM 2 (2010 Edition)

(PLEASE USE BLOCK LETTERS)

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Fill when Form 1 indicates canker is well established. The information opn Form 2 must be filled out for all trees when doing a Butternut Health Assessment.

Site Code(A,B,...Z, AA...)

Surveyor ID or BHA #: 002

Surveyor Last Name

Date (dd/mm/yyyy): 07 - 06 - 2019

Tree ID Numbering: 1,2,3,...Starting from 1 for each site

Tree #: 1 | Zone: 18 | Easting: 428261 | Northing: 5018398

Crown Class | Live Crown %: 40 | Main Stem Length(m) Below crown | Seed Signs

- [ ] Twig Dieback
- [ ] Branch Dieback
- [ ] Defoliation
- [ ] Discolouration

#Stems: 2 | DBH(cm): 46

Butternut Origin: [ ] Natural [ ] Planted [ ] Unknown

Seed Signs: [ ] Male Flowers [ ] Female Flowers [ ] Seed Set [ ] None

Assess below live crown: #Epic-Live | #Epic-Dead | Bark Type | # Callused Wounds

	#Open	#Sooty
Root		
=<2m		
>2m		

Metres from badly cankered tree: [ ] < 40 [ ] > 40 [ ] None Found

Competing Species

Tree #: 2 | Zone: 18 | Easting: 428244 | Northing: 5018371

Crown Class | Live Crown %: 90 | Main Stem Length(m) Below crown: 14 | Seed Signs

- [ ] Twig Dieback
- [ ] Branch Dieback
- [ ] Defoliation
- [ ] Discolouration

#Stems: 3 | DBH(cm): 88

Butternut Origin: [ ] Natural [ ] Planted [ ] Unknown

Seed Signs: [ ] Male Flowers [ ] Female Flowers [ ] Seed Set [ ] None

Assess below live crown: #Epic-Live | #Epic-Dead | Bark Type | # Callused Wounds: 3

	#Open	#Sooty
Root	5	3
=<2m	1	3
>2m	0	0

Metres from badly cankered tree: [x] < 40 [ ] > 40 [ ] None Found

Competing Species

No hybrid characteristics observed - likely a remnant Bn population pre-development

---

Tree #: 3 | Zone: 18 | Easting: 428238 | Northing: 5018400

Crown Class | Live Crown %: 80 | Main Stem Length(m) Below crown: 10 | Seed Signs

- [ ] Twig Dieback
- [ ] Branch Dieback
- [ ] Defoliation
- [ ] Discolouration

#Stems: 1 | DBH(cm): 27

Butternut Origin: [ ] Natural [ ] Planted [ ] Unknown

Seed Signs: [ ] Male Flowers [ ] Female Flowers [ ] Seed Set [ ] None

Assess below live crown: #Epic-Live | #Epic-Dead | Bark Type | # Callused Wounds: 8

	#Open	#Sooty
Root	4	0
=<2m	2	3
>2m	1	2

Metres from badly cankered tree: [x] < 40 [ ] > 40 [ ] None Found

Competing Species

Tree #: 4 | Zone: 18 | Easting: 428239 | Northing: 5018399

Crown Class | Live Crown %: 0 | Main Stem Length(m) Below crown | Seed Signs

- [ ] Twig Dieback
- [ ] Branch Dieback
- [ ] Defoliation
- [ ] Discolouration

#Stems: 1 | DBH(cm): 27

Butternut Origin: [ ] Natural [ ] Planted [ ] Unknown

Seed Signs: [ ] Male Flowers [ ] Female Flowers [ ] Seed Set [ ] None

Assess below live crown: #Epic-Live | #Epic-Dead | Bark Type | # Callused Wounds

	#Open	#Sooty
Root		
=<2m		
>2m		

Metres from badly cankered tree: [ ] < 40 [ ] > 40 [ ] None Found

Competing Species

Tree #: 5 | Zone: 18 | Easting: 428253 | Northing: 5018394

Crown Class | Live Crown %: 0 | Main Stem Length(m) Below crown | Seed Signs

- [ ] Twig Dieback
- [ ] Branch Dieback
- [ ] Defoliation
- [ ] Discolouration

#Stems: 1 | DBH(cm): 22

Butternut Origin: [ ] Natural [ ] Planted [ ] Unknown

Seed Signs: [ ] Male Flowers [ ] Female Flowers [ ] Seed Set [ ] None

Assess below live crown: #Epic-Live | #Epic-Dead | Bark Type | # Callused Wounds

	#Open	#Sooty
Root		
=<2m		
>2m		

Metres from badly cankered tree: [ ] < 40 [ ] > 40 [ ] None Found

Competing Species

Very healthy young Bn but storm broke crown off

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Butternut Data Collection FORM 2 (2010 Edition)

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Fill when Form 1 indicates canker is well established. The information opn Form 2 must be filled out for all trees when doing a Butternut Health Assessment.

Site Code(A,B,...Z, AA...) | Surveyor ID or BHA # 002

Surveyor Last Name

Date (dd/mm/yyyy) 07 - 06 - 2019

Tree ID Numbering: 1,2,3,...Starting from 1 for each site

Tree # 6 | Zone 18 | Easting 428266 | Northing 5018453

Crown Class | Live Crown % 90 | Main Stem Length(m) Below crown 14 | Seed Signs

2 ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | 2 #Stems | 57 DBH(cm)

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown: #Epic-Live | #Epic-Dead | Bark Type | 2 # Callused Wounds

	#Open	#Sooty
Root	1	1
=<2m	2	4
>2m	1	0

Metres from badly cankered tree: ☐ < 40 ☒ > 40 ☐ None Found

Competing Species

Tree # 7 | Zone 18 | Easting 428167 | Northing 5019144

2 Crown Class | Live Crown % 95 | Main Stem Length(m) Below crown 2 | Seed Signs

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | 1 #Stems | 8 DBH(cm)

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown: #Epic-Live | #Epic-Dead | Bark Type | 0 # Callused Wounds

	#Open	#Sooty
Root	0	0
=<2m	0	0
>2m	0	0

Metres from badly cankered tree: ☐ < 40 ☒ > 40 ☐ None Found

Competing Species

Tree # 8 | Zone 18 | Easting 428307 | Northing 5018900

Crown Class | Live Crown % 95 | Main Stem Length(m) Below crown 10 | Seed Signs

2 ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | 1 #Stems | 40 DBH(cm)

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown: #Epic-Live | #Epic-Dead | Bark Type | 0 # Callused Wounds

	#Open	#Sooty
Root	0	0
=<2m	0	0
>2m	0	0

Metres from badly cankered tree: ☐ < 40 ☒ > 40 ☐ None Found

Competing Species

Tree # 9 | Zone 18 | Easting 428298 | Northing 5018672

Crown Class | Live Crown % 95 | Main Stem Length(m) Below crown 1 | Seed Signs

2 ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | 9 #Stems | 6 DBH(cm)

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown: #Epic-Live | #Epic-Dead | Bark Type | 0 # Callused Wounds

	#Open	#Sooty
Root	0	0
=<2m	0	0
>2m	0	0

Metres from badly cankered tree: ☐ < 40 ☒ > 40 ☐ None Found

Competing Species

All coppice coming out of old cut stump. Assessed the dominant stem

---

Tree # 10 | Zone 18 | Easting 428426 | Northing 5018545

2 Crown Class | Live Crown % 100 | Main Stem Length(m) Below crown 2 | Seed Signs

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | 1 #Stems | 6 DBH(cm)

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown: #Epic-Live | #Epic-Dead | Bark Type | 6 # Callused Wounds

	#Open	#Sooty
Root	0	0
=<2m	0	0
>2m	0	0

Metres from badly cankered tree: ☐ < 40 ☐ > 40 ☐ None Found

Competing Species

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Butternut Data Collection FORM 2 (2010 Edition)

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Site Code(A,B,...Z, AA...)

Surveyor ID or BHA #: 002

Surveyor Last Name

Date (dd/mm/yyyy): 08 - 06 - 2019

Tree ID Numbering: 1,2,3,...Starting from 1 for each site

Tree # 11 | Zone 18 | Easting 428422 | Northing 5018505

Crown Class | Live Crown %: 100 | Main Stem Length(m) Below crown: 2 | Seed Signs

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems: 1 | DBH(cm): 20

Butternut Origin: Natural | Planted | Unknown

Seed Signs: Male Flowers | Female Flowers | Seed Set | None

Assess below live crown: #Epic-Live | #Epic-Dead | Bark Type | # Callused Wounds: 0

	#Open	#Sooty
Root	1	0
=<2m	0	0
>2m	0	0

Metres from badly cankered tree: < 40 | > 40 | None Found

Competing Species

Tree # 12 | Zone 18 | Easting 428781 | Northing 5018999

Crown Class | Live Crown %: 95 | Main Stem Length(m) Below crown: 5 | Seed Signs

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems: 1 | DBH(cm): 56

Butternut Origin: Natural | Planted | Unknown

Seed Signs: Male Flowers | Female Flowers | Seed Set | None

Assess below live crown: #Epic-Live | #Epic-Dead | Bark Type | # Callused Wounds: 2

	#Open	#Sooty
Root	3	2
=<2m	0	1
>2m	0	0

Metres from badly cankered tree: < 40 | > 40 | None Found

Competing Species

Tree # 13 | Zone 18 | Easting 428790 | Northing 5018990

Crown Class | Live Crown %: 90 | Main Stem Length(m) Below crown: 3 | Seed Signs

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems: 1 | DBH(cm): 22

Butternut Origin: Natural | Planted | Unknown

Seed Signs: Male Flowers | Female Flowers | Seed Set | None

Assess below live crown: #Epic-Live | #Epic-Dead | Bark Type | # Callused Wounds: 5

	#Open	#Sooty
Root	0	0
=<2m	1	5
>2m	0	1

Metres from badly cankered tree: < 40 | > 40 | None Found

Competing Species

Tree # 14 | Zone 18 | Easting 428784 | Northing 5019013

Crown Class | Live Crown %: 100 | Main Stem Length(m) Below crown: 3 | Seed Signs

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems: 1 | DBH(cm): 27

Butternut Origin: Natural | Planted | Unknown

Seed Signs: Male Flowers | Female Flowers | Seed Set | None

Assess below live crown: #Epic-Live | #Epic-Dead | Bark Type | # Callused Wounds: 1

	#Open	#Sooty
Root	0	2
=<2m	0	0
>2m	0	0

Metres from badly cankered tree: < 40 | > 40 | None Found

Competing Species

Storm damage injury in crown but healing + healthy

Tree # 15 | Zone 18 | Easting 428771 | Northing 5018999

Crown Class | Live Crown %: 85 | Main Stem Length(m) Below crown: 8 | Seed Signs

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems: 1 | DBH(cm): 35

Butternut Origin: Natural | Planted | Unknown

Seed Signs: Male Flowers | Female Flowers | Seed Set | None

Assess below live crown: #Epic-Live | #Epic-Dead | Bark Type | # Callused Wounds: 6

	#Open	#Sooty
Root	6	0
=<2m	0	3
>2m	0	4

Metres from badly cankered tree: < 40 | > 40 | None Found

Competing Species

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Butternut Data Collection FORM 2 (2010 Edition)

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Site Code(A,B,...Z, AA...) | Surveyor ID or BHA # 002

Surveyor Last Name

Date (dd/mm/yyyy) 08 - 06 - 2019

Tree ID Numbering: 1,2,3,...Starting from 1 for each site

Tree # 16 | Zone 18 | Easting 428768 | Northing 5019004

Crown Class | Live Crown % 90 | Main Stem Length(m) Below crown 3 | Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

3 ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems 1 | DBH(cm) 26

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

Assess below live crown: #Epic-Live | #Epic-Dead | Bark Type | 0 # Callused Wounds

	#Open	#Sooty
Root	0	0
=<2m	0	0
>2m	0	0

Metres from badly cankered tree: ■ < 40 ☐ > 40 ☐ None Found

Competing Species

Tree # 17 | Zone 18 | Easting 428767 | Northing 5019019

Crown Class | Live Crown % 85 | Main Stem Length(m) Below crown 6 | Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

3 ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems 1 | DBH(cm) 39

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

Assess below live crown: #Epic-Live | #Epic-Dead | Bark Type | 5 # Callused Wounds

	#Open	#Sooty
Root	6	3
=<2m	2	2
>2m	0	0

Metres from badly cankered tree: ■ < 40 ☐ > 40 ☐ None Found

Competing Species

Tree # 18 | Zone 18 | Easting 428764 | Northing 5019019

Crown Class | Live Crown % 85 | Main Stem Length(m) Below crown 3 | Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

1 ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems 1 | DBH(cm) 37

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

Assess below live crown: #Epic-Live | #Epic-Dead | 8 Bark Type | 10 # Callused Wounds

	#Open	#Sooty
Root	3	2
=<2m	3	1
>2m	1	1

Metres from badly cankered tree: ☐ < 40 ■ > 40 ☐ None Found

Competing Species

Tree # 19 | Zone 18 | Easting 428768 | Northing 5019017

Crown Class | Live Crown % 95 | Main Stem Length(m) Below crown 7 | Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

3 ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems 1 | DBH(cm) 40

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

Assess below live crown: #Epic-Live | #Epic-Dead | Bark Type | 1 # Callused Wounds

	#Open	#Sooty
Root	0	1
=<2m	0	0
>2m	0	0

Metres from badly cankered tree: ■ < 40 ☐ > 40 ☐ None Found

Competing Species

Tree # 20 | Zone 18 | Easting 428672 | Northing 5018945

Crown Class | Live Crown % 100 | Main Stem Length(m) Below crown 1 | Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

2 ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems 1 | DBH(cm) 2

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

Assess below live crown: #Epic-Live | #Epic-Dead | Bark Type | 6 # Callused Wounds

	#Open	#Sooty
Root	0	0
=<2m	0	0
>2m	0	0

Metres from badly cankered tree: ☐ < 40 ■ > 40 ☐ None Found

Competing Species

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Butternut Data Collection FORM 2 (2010 Edition)

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Site Code(A,B,...Z, AA...) | Surveyor ID or BHA # 002

Surveyor Last Name | Date (dd/mm/yyyy) 08-06-2019

Tree ID Numbering: 1,2,3,...Starting from 1 for each site

Tree # 21 | Zone 18 | Easting 429167 | Northing 5018963

Crown Class | Live Crown % 90 | Main Stem Length(m) Below crown 4 | Seed Signs

- [ ] Twig Dieback
- [ ] Branch Dieback
- [ ] Defoliation
- [ ] Discolouration

#Stems 1 | DBH(cm) 7

Butternut Origin: [ ] Natural [ ] Planted [ ] Unknown

Seed Signs: [ ] Male Flowers [ ] Female Flowers [ ] Seed Set [ ] None

Assess below live crown

	#Open	#Sooty
#Epic-Live		
#Epic-Dead		
Root	0	1
Bark Type =<2m	0	2
7 # Callused Wounds >2m	0	1

Metres from badly cankered tree: [ ] < 40 [x] > 40 [ ] None Found

Competing Species

Tree # 22 | Zone 18 | Easting 429152 | Northing 5018995

Crown Class | Live Crown % 95 | Main Stem Length(m) Below crown 8 | Seed Signs

- [ ] Twig Dieback
- [ ] Branch Dieback
- [ ] Defoliation
- [ ] Discolouration

#Stems 1 | DBH(cm) 29

Butternut Origin: [ ] Natural [ ] Planted [ ] Unknown

Seed Signs: [ ] Male Flowers [ ] Female Flowers [ ] Seed Set [ ] None

Assess below live crown

	#Open	#Sooty
#Epic-Live		
#Epic-Dead		
Root	1	0
Bark Type =<2m	1	0
2 # Callused Wounds >2m	0	0

Metres from badly cankered tree: [ ] < 40 [x] > 40 [ ] None Found

Competing Species

Tree # 23 | Zone 18 | Easting 429149 | Northing 5019004

Crown Class | Live Crown % 90 | Main Stem Length(m) Below crown 8 | Seed Signs

- [ ] Twig Dieback
- [ ] Branch Dieback
- [ ] Defoliation
- [ ] Discolouration

#Stems 2 | DBH(cm) 71

Butternut Origin: [ ] Natural [ ] Planted [ ] Unknown

Seed Signs: [ ] Male Flowers [ ] Female Flowers [ ] Seed Set [ ] None

Assess below live crown

	#Open	#Sooty
#Epic-Live		
#Epic-Dead		
Root	0	1
Bark Type =<2m	0	4
3 # Callused Wounds >2m	0	1

Metres from badly cankered tree: [ ] < 40 [x] > 40 [ ] None Found

Competing Species

Tree # 24 | Zone 18 | Easting 429150 | Northing 5018005

Crown Class | Live Crown % 95 | Main Stem Length(m) Below crown 10 | Seed Signs

- [ ] Twig Dieback
- [ ] Branch Dieback
- [ ] Defoliation
- [ ] Discolouration

#Stems 1 | DBH(cm) 29

Butternut Origin: [ ] Natural [ ] Planted [ ] Unknown

Seed Signs: [ ] Male Flowers [ ] Female Flowers [ ] Seed Set [ ] None

Assess below live crown

	#Open	#Sooty
#Epic-Live		
#Epic-Dead		
Root	0	2
Bark Type =<2m	1	2
1 # Callused Wounds >2m	0	0

Metres from badly cankered tree: [ ] < 40 [x] > 40 [ ] None Found

Competing Species

Tree # 25 | Zone 18 | Easting 429147 | Northing 5018995

Crown Class | Live Crown % 95 | Main Stem Length(m) Below crown 5 | Seed Signs

- [ ] Twig Dieback
- [ ] Branch Dieback
- [ ] Defoliation
- [ ] Discolouration

#Stems 1 | DBH(cm) 32

Butternut Origin: [ ] Natural [ ] Planted [ ] Unknown

Seed Signs: [ ] Male Flowers [ ] Female Flowers [ ] Seed Set [ ] None

Assess below live crown

	#Open	#Sooty
#Epic-Live		
#Epic-Dead		
Root	0	1
Bark Type =<2m	0	0
0 # Callused Wounds >2m	0	0

Metres from badly cankered tree: [ ] < 40 [x] > 40 [ ] None Found

Competing Species

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Site Code(A,B,...Z, AA...) | Surveyor ID or BHA # 002 | Surveyor Last Name | Date (dd/mm/yyyy) 08 - 06 - 2019

Tree ID Numbering: 1,2,3,...Starting from 1 for each site

Tree # 26 | Zone 18 | Easting 429131 | Northing 5018990

Crown Class | Live Crown % 85 | Main Stem Length(m) Below crown 9 | Seed Signs

2 | Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 32

Butternut Origin: Natural | Planted | Unknown

Seed Signs: Male Flowers | Female Flowers | Seed Set | None

Assess below live crown: #Epic-Live | #Epic-Dead | Bark Type | # Callused Wounds 2

	#Open	#Sooty
Root	1	2
=<2m	1	5
>2m	0	0

Metres from badly cankered tree: < 40 | > 40 | None Found

Competing Species

Tree # 27 | Zone 18 | Easting 429129 | Northing 5018991

Crown Class | Live Crown % 80 | Main Stem Length(m) Below crown 4 | Seed Signs

1 | Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 21

Butternut Origin: Natural | Planted | Unknown

Seed Signs: Male Flowers | Female Flowers | Seed Set | None

Assess below live crown: #Epic-Live | #Epic-Dead | Bark Type | # Callused Wounds 10

	#Open	#Sooty
Root	0	0
=<2m	5	0
>2m	1	0

Metres from badly cankered tree: < 40 | > 40 | None Found

Competing Species

None of the open 'cankers' are active. - not heavily cankered

---

Tree # 28 | Zone 18 | Easting 429128 | Northing 5019000

Crown Class | Live Crown % 95 | Main Stem Length(m) Below crown 6 | Seed Signs

2 | Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 36

Butternut Origin: Natural | Planted | Unknown

Seed Signs: Male Flowers | Female Flowers | Seed Set | None

Assess below live crown: #Epic-Live | #Epic-Dead | Bark Type | # Callused Wounds 4

	#Open	#Sooty
Root	0	0
=<2m	0	4
>2m	0	0

Metres from badly cankered tree: < 40 | > 40 | None Found

Competing Species

Tree # 29 | Zone 18 | Easting 429142 | Northing 5019009

Crown Class | Live Crown % 95 | Main Stem Length(m) Below crown 7 | Seed Signs

2 | Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 31

Butternut Origin: Natural | Planted | Unknown

Seed Signs: Male Flowers | Female Flowers | Seed Set | None

Assess below live crown: #Epic-Live | #Epic-Dead | Bark Type | # Callused Wounds 0

	#Open	#Sooty
Root	1	1
=<2m	0	1
>2m	0	1

Metres from badly cankered tree: < 40 | > 40 | None Found

Competing Species

Tree # 30 | Zone 18 | Easting 428977 | Northing 5018593

Crown Class | Live Crown % 90 | Main Stem Length(m) Below crown 7 | Seed Signs

2 | Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 69

Butternut Origin: Natural | Planted | Unknown

Seed Signs: Male Flowers | Female Flowers | Seed Set | None

Assess below live crown: #Epic-Live | #Epic-Dead | Bark Type | # Callused Wounds 0

	#Open	#Sooty
Root	0	0
=<2m	0	0
>2m	0	0

Metres from badly cankered tree: < 40 | > 40 | None Found

Competing Species

Hollow old Bu

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Surveyor ID or BHA #: 002

Surveyor Last Name

Date (dd/mm/yyyy): 12-06-2019

Tree ID Numbering: 1,2,3,...Starting from 1 for each site

Tree # 31

Zone 18 | Easting 429257 | Northing 5018659

Crown Class | Live Crown %: 95 | Main Stem Length(m) Below crown: 2

2 | ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems: 2 | DBH(cm): 66

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown: #Epic-Live | #Epic-Dead | Bark Type | # Callused Wounds: 2

	#Open	#Sooty
Root	0	4
=<2m	1	1
>2m	0	1

Metres from badly cankered tree: ☐ < 40 ☒ > 40 ☐ None Found

Competing Species

DBH - 55cm and 37cm. Did not mark - on south side of cart path near Knudson Dr

Tree # 32

Zone 18 | Easting 428968 | Northing 5018534

Crown Class | Live Crown %: 10 | Main Stem Length(m) Below crown:

1 | ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems: 2 | DBH(cm): 40

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown: #Epic-Live | #Epic-Dead | Bark Type | # Callused Wounds:

	#Open	#Sooty
Root		
=<2m		
>2m		

Metres from badly cankered tree: ☐ < 40 ☐ > 40 ☐ None Found

Competing Species

Tree # 33

Zone 18 | Easting 428961 | Northing 5018525

Crown Class | Live Crown %: 80 | Main Stem Length(m) Below crown: 4

3 | ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems: 1 | DBH(cm): 50

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown: #Epic-Live | #Epic-Dead | Bark Type | # Callused Wounds: 1

	#Open	#Sooty
Root	0	3
=<2m	0	0
>2m	0	0

Metres from badly cankered tree: ☒ < 40 ☐ > 40 ☐ None Found

Competing Species

Not marked with paint - Unsure if it is on property

Tree # 34

Zone 18 | Easting 429157 | Northing 5018701

Crown Class | Live Crown %: 80 | Main Stem Length(m) Below crown: 8

3 | ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems: | DBH(cm): 47

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown: #Epic-Live | #Epic-Dead | Bark Type | # Callused Wounds: 1 1

	#Open	#Sooty
Root	1	1
=<2m	2	5
>2m	1	4

Metres from badly cankered tree: ☒ < 40 ☐ > 40 ☐ None Found

Competing Species

Tree # 35

Zone 18 | Easting 429157 | Northing 5018700

Crown Class | Live Crown %: 85 | Main Stem Length(m) Below crown: 6

3 | ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems: 1 | DBH(cm): 50

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown: #Epic-Live | #Epic-Dead | Bark Type | # Callused Wounds: 7

	#Open	#Sooty
Root	1	1
=<2m	1	2
>2m	1	0

Metres from badly cankered tree: ☒ < 40 ☐ > 40 ☐ None Found

Competing Species

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Tree ID Numbering: 1,2,3,...Starting from 1 for each site

Tree # 36 | Zone 18 | Easting 429166 | Northing 5018701

Crown Class | Live Crown % 20 | Main Stem Length(m) Below crown | Seed Signs: Male Flowers, Female Flowers, Seed Set, None

Twig Dieback, Branch Dieback, Defoliation, Discolouration | #Stems 1 | DBH(cm) 26 | Butternut Origin: Natural, Planted, Unknown

Assess below live crown: #Epic-Live, #Epic-Dead, Bark Type, # Callused Wounds | #Open, #Sooty: Root, =<2m, >2m

Metres from badly cankered tree: < 40, > 40, None Found

Competing Species

Tree # 37 | Zone 18 | Easting 429168 | Northing 5018710

Crown Class | Live Crown % 0 | Main Stem Length(m) Below crown | Seed Signs: Male Flowers, Female Flowers, Seed Set, None

Twig Dieback, Branch Dieback, Defoliation, Discolouration | #Stems 1 | DBH(cm) 20 | Butternut Origin: Natural, Planted, Unknown

Assess below live crown: #Epic-Live, #Epic-Dead, Bark Type, # Callused Wounds | #Open, #Sooty: Root, =<2m, >2m

Metres from badly cankered tree: < 40, > 40, None Found

Competing Species

Tree # 38 | Zone 18 | Easting 429174 | Northing 5018708

Crown Class | Live Crown % 30 | Main Stem Length(m) Below crown | Seed Signs: Male Flowers, Female Flowers, Seed Set, None

Twig Dieback, Branch Dieback, Defoliation, Discolouration | #Stems 1 | DBH(cm) 37 | Butternut Origin: Natural, Planted, Unknown

Assess below live crown: #Epic-Live, #Epic-Dead, Bark Type, # Callused Wounds | #Open, #Sooty: Root, =<2m, >2m

Metres from badly cankered tree: < 40, > 40, None Found

Competing Species

Tree # 39 | Zone 18 | Easting 429183 | Northing 5018698

Crown Class | Live Crown % 90 | Main Stem Length(m) Below crown 3 | Seed Signs: Male Flowers, Female Flowers, Seed Set, None

Twig Dieback, Branch Dieback, Defoliation, Discolouration | #Stems 1 | DBH(cm) 21 | Butternut Origin: Natural, Planted, Unknown

Assess below live crown: #Epic-Live, #Epic-Dead, Bark Type, # Callused Wounds 3 | #Open, #Sooty: Root 2 1, =<2m 3 1, >2m 0 0

Metres from badly cankered tree: < 40, > 40, None Found

Competing Species

Tree # 40 | Zone 18 | Easting 429184 | Northing 5018696

Crown Class | Live Crown % 90 | Main Stem Length(m) Below crown 7 | Seed Signs: Male Flowers, Female Flowers, Seed Set, None

Twig Dieback, Branch Dieback, Defoliation, Discolouration | #Stems 1 | DBH(cm) 16 | Butternut Origin: Natural, Planted, Unknown

Assess below live crown: #Epic-Live, #Epic-Dead, Bark Type, # Callused Wounds 6 | #Open, #Sooty: Root 1 0, =<2m 0 2, >2m 1 0

Metres from badly cankered tree: < 40, > 40, None Found

Competing Species

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Site Code(A,B,...Z, AA...) | Surveyor ID or BHA # 002

Surveyor Last Name | Date (dd/mm/yyyy) 12-06-2019

Tree ID Numbering: 1,2,3,...Starting from 1 for each site

Tree # 41 | **Zone** 18 | **Easting** 428971 | **Northing** 5018607

2 | Crown Class | Live Crown % 95 | Main Stem Length(m) Below crown .4

Twig Dieback | Branch Dieback | Defoliation | Discolouration

#Stems 1 | DBH(cm) 55

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown

	#Open	#Sooty
#Epic-Live		
#Epic-Dead		
Root	5	1
Bark Type =<2m	1	3
3 # Callused Wounds >2m	0	0

Metres from badly cankered tree: ☐ < 40 ☒ > 40 ☐ None Found

Competing Species

Tree # 42 | **Zone** 18 | **Easting** 428908 | **Northing** 5018583

2 | Crown Class | Live Crown % 85 | Main Stem Length(m) Below crown 2

Twig Dieback | Branch Dieback | Defoliation | Discolouration

#Stems 1 | DBH(cm) 26

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown

	#Open	#Sooty
#Epic-Live		
#Epic-Dead		
Root	0	0
Bark Type =<2m	0	0
1 # Callused Wounds >2m	0	0

Metres from badly cankered tree: ☐ < 40 ☒ > 40 ☐ None Found

Competing Species

Tree # 43 | **Zone** 18 | **Easting** 428901 | **Northing** 5018575

2 | Crown Class | Live Crown % 90 | Main Stem Length(m) Below crown 5

Twig Dieback | Branch Dieback | Defoliation | Discolouration

#Stems 2 | DBH(cm) 29

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown

	#Open	#Sooty
#Epic-Live		
#Epic-Dead		
Root	0	0
Bark Type =<2m	0	0
0 # Callused Wounds >2m	0	0

Metres from badly cankered tree: ☐ < 40 ☒ > 40 ☐ None Found

Competing Species

Tree # 44 | **Zone** 18 | **Easting** 428880 | **Northing** 5018585

2 | Crown Class | Live Crown % 90 | Main Stem Length(m) Below crown 4

Twig Dieback | Branch Dieback | Defoliation | Discolouration

#Stems 1 | DBH(cm) 32

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown

	#Open	#Sooty
#Epic-Live		
#Epic-Dead		
Root	2	0
Bark Type =<2m	1	0
3 # Callused Wounds >2m	0	0

Metres from badly cankered tree: ☐ < 40 ☒ > 40 ☐ None Found

Competing Species

Tree # 45 | **Zone** 18 | **Easting** 428881 | **Northing** 5018589

2 | Crown Class | Live Crown % 95 | Main Stem Length(m) Below crown 5

Twig Dieback | Branch Dieback | Defoliation | Discolouration

#Stems 1 | DBH(cm) 61

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown

	#Open	#Sooty
#Epic-Live		
#Epic-Dead		
Root	1	1
Bark Type =<2m	0	1
12 # Callused Wounds >2m	0	0

Metres from badly cankered tree: ☐ < 40 ☒ > 40 ☐ None Found

Competing Species

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Site Code(A,B,...Z, AA...):

Surveyor ID or BHA #: 002

Date (dd/mm/yyyy): 12-06-2019

Surveyor Last Name:

Tree ID Numbering: 1,2,3,...Starting from 1 for each site

2

Tree #: 46 | Zone: 18 | Easting: 428873 | Northing: 5018598

Crown Class: | Live Crown %: 100 | Main Stem Length(m) Below crown: 0

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration

#Stems: 1 | DBH(cm): 1

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown: #Epic-Live: | #Epic-Dead: | Bark Type: | # Callused Wounds: 0

	#Open	#Sooty
Root	0	0
=<2m	0	0
>2m	0	0

Metres from badly cankered tree: ☐ < 40 ☐ > 40 ☐ None Found

Competing Species:

New seedling

Tree #: | Zone: 1 | Easting: | Northing:

Crown Class: | Live Crown %: | Main Stem Length(m) Below crown:

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration

#Stems: | DBH(cm):

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown: #Epic-Live: | #Epic-Dead: | Bark Type: | # Callused Wounds:

	#Open	#Sooty
Root		
=<2m		
>2m		

Metres from badly cankered tree: ☐ < 40 ☐ > 40 ☐ None Found

Competing Species:

Tree #: | Zone: 1 | Easting: | Northing:

Crown Class: | Live Crown %: | Main Stem Length(m) Below crown:

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration

#Stems: | DBH(cm):

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown: #Epic-Live: | #Epic-Dead: | Bark Type: | # Callused Wounds:

	#Open	#Sooty
Root		
=<2m		
>2m		

Metres from badly cankered tree: ☐ < 40 ☐ > 40 ☐ None Found

Competing Species:

Tree #: | Zone: 1 | Easting: | Northing:

Crown Class: | Live Crown %: | Main Stem Length(m) Below crown:

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration

#Stems: | DBH(cm):

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown: #Epic-Live: | #Epic-Dead: | Bark Type: | # Callused Wounds:

	#Open	#Sooty
Root		
=<2m		
>2m		

Metres from badly cankered tree: ☐ < 40 ☐ > 40 ☐ None Found

Competing Species:

Tree #: | Zone: 1 | Easting: | Northing:

Crown Class: | Live Crown %: | Main Stem Length(m) Below crown:

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration

#Stems: | DBH(cm):

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown: #Epic-Live: | #Epic-Dead: | Bark Type: | # Callused Wounds:

	#Open	#Sooty
Root		
=<2m		
>2m		

Metres from badly cankered tree: ☐ < 40 ☐ > 40 ☐ None Found

Competing Species:

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