McKINLEY
ENVIRONMENTAL
SOLUTIONS

Combined Environmental Impact Statement & Tree Conservation Report (Revised)
Minto Communities and 2559688 Ontario Inc.
Kanata North Development (936 March Road)

July 2019

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LIST OF FIGURES

EXECUTIVE SUMMARY

McKinley Environmental Solutions (MES) was retained by Minto Communities to prepare a Combined Environmental Impact Statement (EIS) and Tree Conservation Report (TCR) to support the development of the Southeast Quadrant of the Kanata North Urban Expansion Area (KNUEA), which includes the property at 936 March Road, Ottawa, Ontario (the Study Area). In order to remain consistent with previous studies completed as part of the urban expansion area process, the entirety of the KNUEA Southeast Quadrant is included within the Study Area for this Combined EIS and TCR. The Community Design Plan (CDP) and the associated Environmental Management Plan (EMP) for the KNUEA were approved by Ottawa City Council in 2016. Notably, the KNUEA EMP establishes a minimum 40 m wide corridor which is to be retained and/or enhanced surrounding the tributaries of Shirley's Brook. The North Tributary of Shirley's Brook flows parallel to the property line in the northwest corner of the Study Area, before turning south and flowing in an approximately north-south direction through the Study Area. The North Branch of Shirley's Brook also flows parallel to the property line in the southwest corner of the Study Area.

The current Study Area is the Southeast Quadrant of the KNUEA, which was previously owned by 2559688 Ontario Inc. Since approval of the KNUEA, the Southeast Quadrant has been severed into several parts. A parcel has been created surrounding the existing farmhouse at 936 March Road and the adjacent agricultural buildings. The parcel surrounding the farmhouse will be retained by the current owners and is not part of the current development proposal. The lands which occur between March Road and the west side of the north-south aligned portion of the 40 m wide North Tributary corridor (blocks identified for future commercial development), continue to be owned by 2559688 Ontario Inc. (the Commercial Blocks). The lands located east of the north-south aligned 40 m wide North Tributary watercourse corridor, a parcel west of the 40 m wide corridor that will accommodate Street #1, and the 40 m wide corridor itself, have been severed and acquired by Minto Communities (the Minto Site). The impact assessment, mitigation, and recommendations included in this Combined EIS and TCR address both the Commercial Blocks and the Minto Site. The development of the Commercial Blocks owned by 2559688 Ontario Inc. is anticipated to require approval through a Site Plan Application, whereas the development of the Minto Site is anticipated to be authorized through a Draft Plan of Subdivision Application. It should be noted that at the time of report preparation, a detailed Site Plan for the development of the Commercial Blocks was not available. It is anticipated that once a detailed Site Plan is available, an addendum to this Combined EIS and TCR may be required to address any changes/details provided by the Site Plan.

The Study Area is located along the east side of March Road, with the KNUEA Northeast Quadrant located directly to the north, and the KNUEA Southwest Quadrant located on the opposite side of March Road. Both of the adjacent KNUEA quadrants are intended to be developed in future as residential subdivisions, although they remain predominantly undeveloped agricultural lands at the current time. An existing subdivision is located south of the Study Area. March Valley Road is located to the east, beyond which is a federally owned property managed by the Department of Defense.

The KNUEA Southeast Quadrant as a whole is approximately 82 ha in size (the Study Area). The Study Area predominantly consists of agricultural lands that are actively cultivated. The Former CN Railway Corridor runs in an approximately north-south direction through the Study Area. Treed habitats within the Study Area include several Coniferous Hedgerows and Deciduous Hedgerows, a Cultural Woodlot surrounding the farmhouse at 936 March Road, Woodlot S-20 and surrounding areas of recent growth, and Woodlot S-23 and surrounding areas of recent growth. The lands west of the railway corridor are within the urban area of the City of Ottawa and are intended to be developed by Minto Communities and 2559688 Ontario Inc. The lands east of the railway corridor are beyond the urban area. The lands east of the railway corridor are to remain predominantly undeveloped, however, a new stormwater management pond is intended to be constructed east of the railway corridor. The lands east of the railway corridor are owned by Minto Communities, and the construction of the stormwater management pond will be undertaken as part of the development of the Minto Site. The KNUEA EMP identifies that the portion of Woodlot S-20 that occurs within the Minto Site is not to be retained as part of the future development. Woodlot S-23 occurs beyond the urban area, and a portion of this feature was identified to be retained and conveyed to the City.

The Minto Site will be developed to accommodate a mix of single detached houses and townhomes. The Minto Site development will also include construction of Street #1, which will connect the development to March Road. Within the Minto Site, Block 511 will accommodate a new school. Blocks 514, 515, and 521 will accommodate a 6 m wide recreational pathway, which is required by the CDP along the edge of the 40 m wide North Tributary watercourse corridor. The pathway is shown along the eastern side of the north-south aligned portion of the 40 m wide North Tributary watercourse corridor. Blocks 516, 517, 518, 519, and 520 provide pathway connections. Block 512 includes an approximately 0.4 ha municipal park and Block 513 includes an approximately 2.62 ha municipal park. East of the Former CN Railway Corridor, Block 526 will accommodate a new Stormwater Management (SWM) pond. The CDP and EMP state that the western portion of Woodlot S-23 is to be retained as a natural heritage feature and conveyed to the City. Block 525 includes the approximately 2.4 ha retained portion of Woodlot S-23. However, it should be noted that the precise limits of the retained area of Woodlot S-23 will depend on the final detailed design of the SWM

Pond, and hence may change as a result of detailed design. It is anticipated that the core of Woodlot S-23 will ultimately be retained. The Minto Site and the Commercial Blocks will receive municipal services. Stormwater runoff will be addressed by the new SWM Pond. The new SWM Pond will outlet clean water to Shirley's Brook east of March Valley Road. The inlet channels to the new SWM Pond will consist of buried pipes, which will be placed outside the limits of the retained portion of Woodlot S-23. The Minto Site and the Commercial Blocks are anticipated to be developed in multiple phases over several years. However, it is anticipated that both areas will be cleared during the initial phase of development, as servicing and grading requirements are not anticipated to allow for phased tree removal.

As noted above, a detailed Site Plan will be required in future to support the development of the Commercial Blocks. While a detailed Site Plan is not currently available, it is anticipated that the Commercial Blocks will be developed to accommodate commercial land uses. Within the CDP and EMP, the entirety of the Commercial Blocks has been identified for future development. There are no designated open space blocks and/or park areas within the Commercial Blocks, with the exception of the lands required to provide a 40 m wide watercourse corridor surrounding the tributaries of Shirley's Brook.

Per the recommendations of the EMP, the Ephemeral Farm Drainage Channels that run through the eastern portion of the Minto Site will be decommissioned. Mitigation measures to address the biological and hydrological functions of the Ephemeral Farm Drainage Channels are discussed throughout this report. As noted above, the KNUEA EMP establishes a minimum 40 m wide corridor of retained and/or enhanced habitat around the tributaries of Shirley's Brook. Within the Minto Site, this corridor is provided by several connected open space blocks that separate the Commercial Blocks (owned by 2559688 Ontario Inc.) from the Minto Communities development. The open space blocks proposed within the Minto Site provide the 40 m wide watercourse corridor for the north-south aligned portion of the North Tributary. The future detailed Site Plan for the Commercial Blocks will be required to identify open space blocks to protect the west-east portions of the North Tributary and the North Branch, which run parallel to the northern and southern boundaries of the Commercial Blocks (respectively).

The portion of the North Tributary that runs through the Study Area will not be realigned as part of the proposed development, and hence it is anticipated that the existing sections of the North Tributary within the Study Area will be fully retained. As discussed below, it is anticipated that habitat enhancement features will be required within the 40 m wide watercourse corridor adjacent to the existing channel, in order to improve the quality of the aquatic habitat and riparian areas for Blanding's Turtles, as well as fish, amphibians, and other wildlife. Habitat improvements are

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anticipated to be required to meet the requirements of a future Overall Benefit Permit(s) for Blanding's Turtle under the Ontario Endangered Species Act. Due to the presence of Butternut Trees and Blanding's Turtle, an Overall Benefit Permit(s) under Clause 17(2)(C) of the Ontario Endangered Species Act is anticipated to be required. Depending on the schedule of development, the Ontario Endangered Species Act requirements for the development of the Southeast Quadrant of the KNUEA may be addressed either by obtaining separate Overall Benefit Permits for the development of the Commercial Blocks and the Minto Site, or by obtaining a single combined permit for the entire quadrant. The permitting approach will be determined in future through discussion with the landowners and the Ministry of Environment, Climate Change, and Parks (MECP).

Pending that the regulatory, mitigation, and avoidance measures outlined in this report are implemented appropriately, the development of the Southeast Quadrant of the KNUEA 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 Integrated 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, 3.2, 3.3, 3.7.2, 4.1 and 4.4.1. 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 Combined Environmental Impact Statement (EIS) and Tree Conservation Report (TCR) was undertaken following the City of Ottawa's Environmental Impact Statement Guidelines. Following the City guidelines, the Combined EIS and TCR includes the following:

- Documentation of existing natural features within and around the Study Area;
- 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 demonstrate that the proposed project will not negatively affect the significant features and functions of the Study Area, and that impacts will be minimized through mitigation measures.

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1.3 Study Area Overview and Background (TCR)

The Study Area is part of the approved Kanata North Urban Expansion Area (KNUEA), which is an urban expansion area located northwest of the developed portion of Kanata. The KNUEA includes approximately 181 hectares on either side of March Road, which will be developed in future to accommodate approximately 3,000 residential dwellings, a mixed-use core, schools, and various parks and trails (Novatech 2016a). During the urban expansion process, the KNUEA was divided into four (4) quadrants, each of which corresponded to the major landowners for that portion of the KNUEA. The ***Study Area*** addressed by this Combined EIS and TCR encompasses the Southeast Quadrant of the KNUEA (Figure 1). In order to remain consistent with previous studies completed as part of the KNUEA process (MEP 2016; Novatech 2016a; 2016b), the entirety of the KNUEA Southeast Quadrant is included within the Study Area for this Combined EIS and TCR.
The Community Design Plan (CDP) and the associated Environmental Management Plan (EMP) for the KNUEA were approved by Ottawa City Council in 2016 (Novatech 2016a; 2016b). Notably, the KNUEA EMP establishes a minimum 40 m wide corridor which is to be retained and/or enhanced surrounding the tributaries of Shirley's Brook (Novatech 2016b). The North Tributary of Shirley's Brook flows parallel to the property line in the northwest corner of the Study Area, before turning south and flowing in an approximately north-south direction through the Study Area. The North Branch of Shirley's Brook also flows parallel to the property line in the southwest corner of the Study Area.

The current Study Area is the Southeast Quadrant of the KNUEA, which was previously owned by 2559688 Ontario Inc. Since approval of the KNUEA, the Southeast Quadrant has been severed into several parts. A parcel has been created surrounding the existing farmhouse at 936 March Road and the adjacent agricultural buildings. The parcel surrounding the farmhouse will be retained by the current owners and is not part of the current development proposal. The lands which occur between March Road and the west side of the north-south aligned portion of the 40 m wide North Tributary corridor (blocks identified for future commercial development), continue to be owned by 2559688 Ontario Inc. (***the Commercial Blocks***). The lands located east of the north-south aligned 40 m wide North Tributary watercourse corridor, a parcel west of the 40 m wide corridor that will accommodate Street #1, and the 40 m wide corridor itself, have been severed and acquired by Minto Communities (***the Minto Site***). The impact assessment, mitigation, and recommendations included in this Combined EIS and TCR address both the Commercial Blocks and the Minto Site. The development of the Commercial Blocks owned by 2559688 Ontario Inc. is anticipated to require approval through a Site Plan Application, whereas the development of the Minto Site is anticipated to be authorized through a Draft Plan of Subdivision Application. It should be noted that at the time of report preparation, a detailed Site Plan for the development of the Commercial Blocks was not

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The KNUEA Southeast Quadrant as a whole is approximately 82 ha in size (the Study Area). The Study Area predominantly consists of agricultural lands that are actively cultivated. The Former CN Railway Corridor runs in an approximately north-south direction through the Study Area. Treed habitats within the Study Area include several Coniferous Hedgerows and Deciduous Hedgerows, a Cultural Woodlot surrounding the farmhouse at 936 March Road, Woodlot S-20 and surrounding areas of recent growth, and Woodlot S-23 and surrounding areas of recent growth. The lands west of the railway corridor are within the urban area of the City of Ottawa and are intended to be developed by Minto Communities and 2559688 Ontario Inc. The lands east of the railway corridor are beyond the urban area. The lands east of the railway corridor are to remain predominantly undeveloped, however, a new stormwater management pond is intended to be constructed east of the railway corridor. The lands east of the railway corridor are owned by Minto Communities, and the construction of the stormwater management pond will be undertaken as part of the Minto Communities development. The KNUEA EMP identifies that the portion of Woodlot S-20 that occurs within the Minto Site is not to be retained as part of the future development. Woodlot S-23 occurs beyond the urban area, and a portion of this feature was identified to be retained and conveyed to the City (Novatech 2016b). Several buildings are found within the Study Area, however, all of the existing buildings are contained within the parcel surrounding the farmhouse at 936 March Road, and hence there are no existing buildings within the Commercial Blocks or the Minto Site.

Lastly, several Species at Risk (SAR) were documented within the Study Area as part of the KNUEA EMP (MEP 2016). The KNUEA EMP documented occurrences of Butternut Trees (endangered) and Blanding's Turtle (threatened) within the Study Area. In addition, several species of special concern are known to be present. These natural heritage features are discussed in greater detail below.

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July 2019

FIGURE 1: STUDY AREA OVERVIEW

Minto Communities & 2559688 Ontario Inc.
Kanata North Development (936 March Road) - Combined EIS & TCR (Revised)

- Study Area

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

1.4 Description of Undertaking (TCR)

The Draft Plan of Subdivision is included below. The Minto Site will be developed to accommodate a mix of single detached houses and townhomes. The Minto Site development will also include construction of Street #1, which will connect the development to March Road. Within the Minto Site, Block 511 will accommodate a new school. Blocks 514, 515, and 521 will accommodate a 6 m wide recreational pathway, which is required by the KNUEA Community Design Plan (CDP) along the edge of the 40 m wide North Tributary watercourse corridor (Novatech 2016a). The pathway is shown along the eastern side of the north-south aligned portion of the 40 m wide North Tributary watercourse corridor. Blocks 516, 517, 518, 519, and 520 provide pathway connections. Block 512 includes an approximately 0.4 ha municipal park and Block 513 includes an approximately 2.62 ha municipal park. East of the Former CN Railway Corridor, Block 526 will accommodate a new Stormwater Management (SWM) pond. The KNUEA CDP and the KNUEA Environmental Management Plan (EMP) (Novatech 2016a; 2016b) state that the western portion of Woodlot S-23 is to be retained as a natural heritage feature and conveyed to the City. Block 525 includes the approximately 2.4 ha retained portion of Woodlot S-23. However, it should be noted that the precise limits of the retained area of Woodlot S-23 will depend on the final detailed design of the SWM Pond, and hence may change as a result of detailed design. It is anticipated that the core of Woodlot S-23 will ultimately be retained. The Minto Site and the Commercial Blocks will receive municipal services. Stormwater runoff will be addressed by the new SWM Pond. The new SWM Pond will outlet clean water to Shirley's Brook east of March Valley Road. The inlet channels to the new SWM Pond will consist of buried pipes, which will be placed outside the limits of the retained portion of Woodlot S-23. The Minto Site and the Commercial Blocks are anticipated to be developed in multiple phases over several years. However, it is anticipated that both areas will be cleared during the initial phase of development, as servicing and grading requirements are not anticipated to allow for phased tree removal.

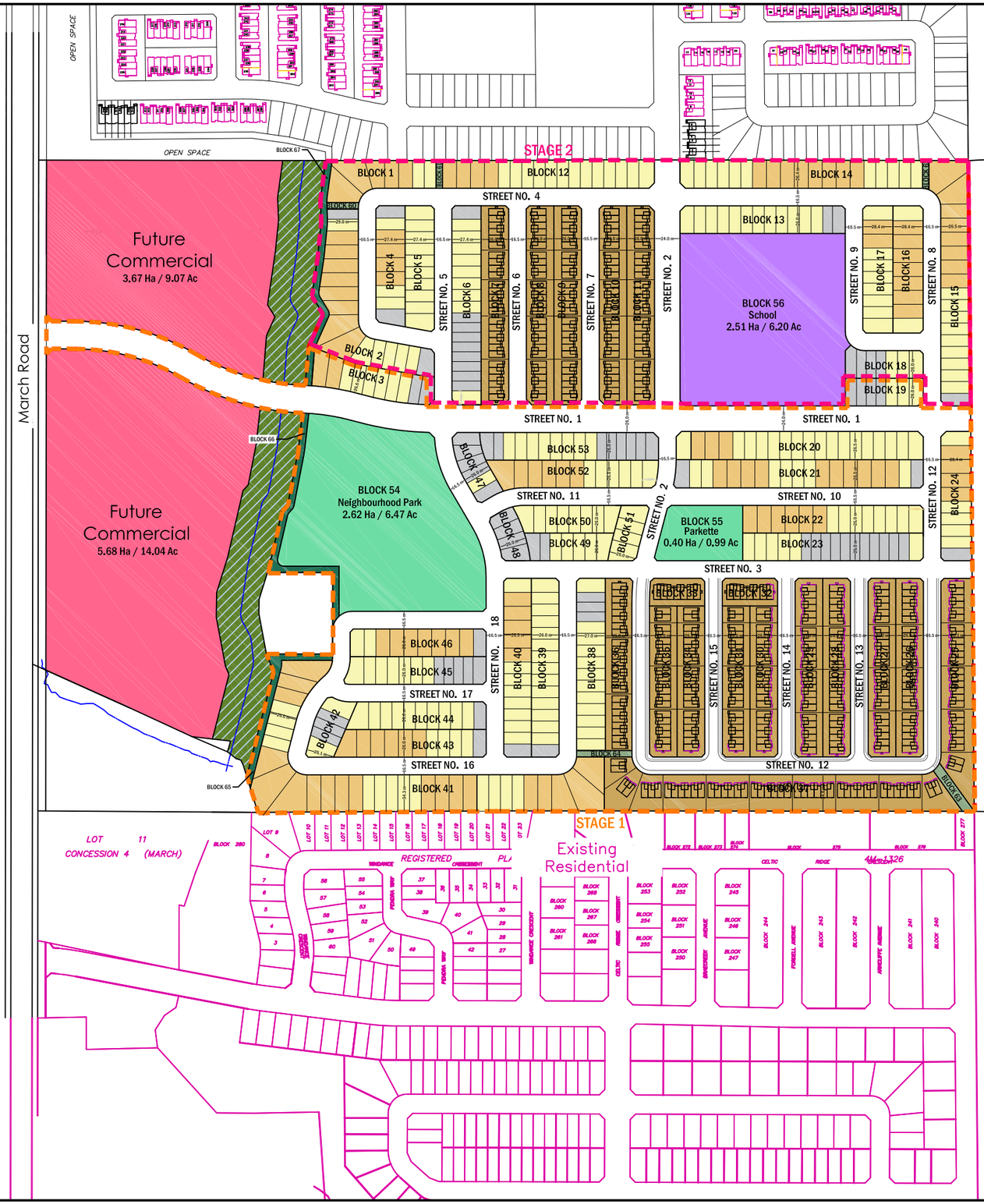
A detailed Site Plan will be required in future to support the development of the Commercial Blocks. While a detailed Site Plan is not currently available, it is anticipated that the Commercial Blocks will be developed to accommodate commercial land uses. Within the KNUEA CDP and EMP, the entirety of the Commercial Blocks was identified for future development (Novatech 2016a; 2016b). There are no designated open space blocks and/or park areas within the Commercial Blocks, with the exception of the lands required to provide a 40 m wide watercourse corridor surrounding the tributaries of Shirley's Brook.

Per the recommendations of the KNUEA EMP, the Ephemeral Farm Drainage Channels that run through the eastern portion of the Minto Site will be decommissioned (Novatech 2016b). As

discussed below, the Ephemeral Farm Drainage Channels were not identified as significant natural features (MEP 2015). Mitigation measures to address the biological and hydrological functions of the Ephemeral Farm Drainage Channels are discussed throughout this report. As noted above, the KNUEA EMP establishes a minimum 40 m wide corridor of retained and/or enhanced habitat around the tributaries of Shirley's Brook (Novatech 2016b). Within the Minto Site, this corridor is provided by several connected open space blocks that separate the Commercial Blocks (owned by 2559688 Ontario Inc.) from the Minto Communities development. The open space blocks proposed within the Minto Site provide the 40 m wide watercourse corridor for the north-south aligned portion of the North Tributary. The future detailed Site Plan for the Commercial Blocks will be required to identify open space blocks to protect the west-east portions of the North Tributary and the North Branch, which run parallel to the northern and southern boundaries of the Commercial Blocks (respectively).

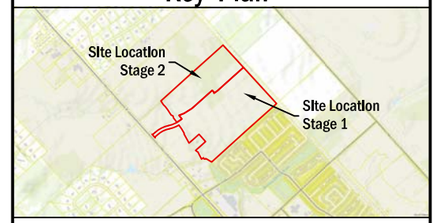
The portion of the North Tributary that runs through the Study Area will not be realigned as part of the proposed development, and hence it is anticipated that the existing sections of the North Tributary within the Study Area will be fully retained. As discussed below, it is anticipated that habitat enhancement features will be required within the 40 m wide watercourse corridor adjacent to the existing channel, in order to improve the quality of the aquatic habitat and riparian areas for Blanding's Turtles, fish, amphibians, and other wildlife. Habitat improvements are anticipated to be required to meet the requirements of a future Overall Benefit Permit(s) for Blanding's Turtle under the Ontario Endangered Species Act. Due to the presence of Butternut Trees and Blanding's Turtle, an Overall Benefit Permit(s) under Clause 17(2)(C) of the Ontario Endangered Species Act is anticipated to be required. Depending on the schedule of development, the Ontario Endangered Species Act requirements for the development of the Southeast Quadrant of the KNUEA may be addressed either by obtaining separate Overall Benefit Permits for the development of the Commercial Blocks and the Minto Site, or by obtaining a single combined permit for the entire quadrant. The permitting approach will be determined in future through discussion with the landowners and the Ministry of Environment, Climate Change, and Parks (MECP).

Street #1 will be constructed as part of the Minto Site development, and will cross the North Tributary in one (1) location. The future road crossing will include a suitable wildlife passage culvert that will allow Blanding's Turtles (and other wildlife) to pass beneath the new road. As discussed below, the minimum 40 m wide corridor surrounding the North Tributary and the North Branch will also include fencing that will be designed to prevent Blanding's Turtle and other wildlife from leaving the 40 m wide watercourse corridor to enter the subdivision/roads.



Unit Type	Stage 1		Stage 2		Total	
Singles	**279**	**49%**	**155**	**53%**	**434**	**51%**
30'	55	20%	20	13%	75	17%
36'	156	56%	89	57%	245	56%
43'	68	24%	46	30%	114	26%
Executive Towns	**285**	**51%**	**135**	**47%**	**420**	**49%**
Avenue Towns	**0**	**0%**	**0**	**0%**	**0**	**0%**
Rear Lane Towns	**0**	**0%**	**0**	**0%**	**0**	**0%**
Total	564		290		**854**	
Parkland Required	= 854 units / 300units per ha				2.85 ha	
Parkland Dedicated	= 2.62 ha + 0.40 ha				3.02 ha	
Overdedicated By					**0.17 ha**	

Key Plan



Notes

1. All dimensions are in meters

- Detached SIngles
- Executive Townhomes
- Schools
- Parkland
- Woodlot
- Storm Water Management (SWM) Pond
- Future Commercial Lands

Root Barrier Locations

No.	REVISION	DATE	BY
0	Issued for Review	9-Jul-19	K.G.

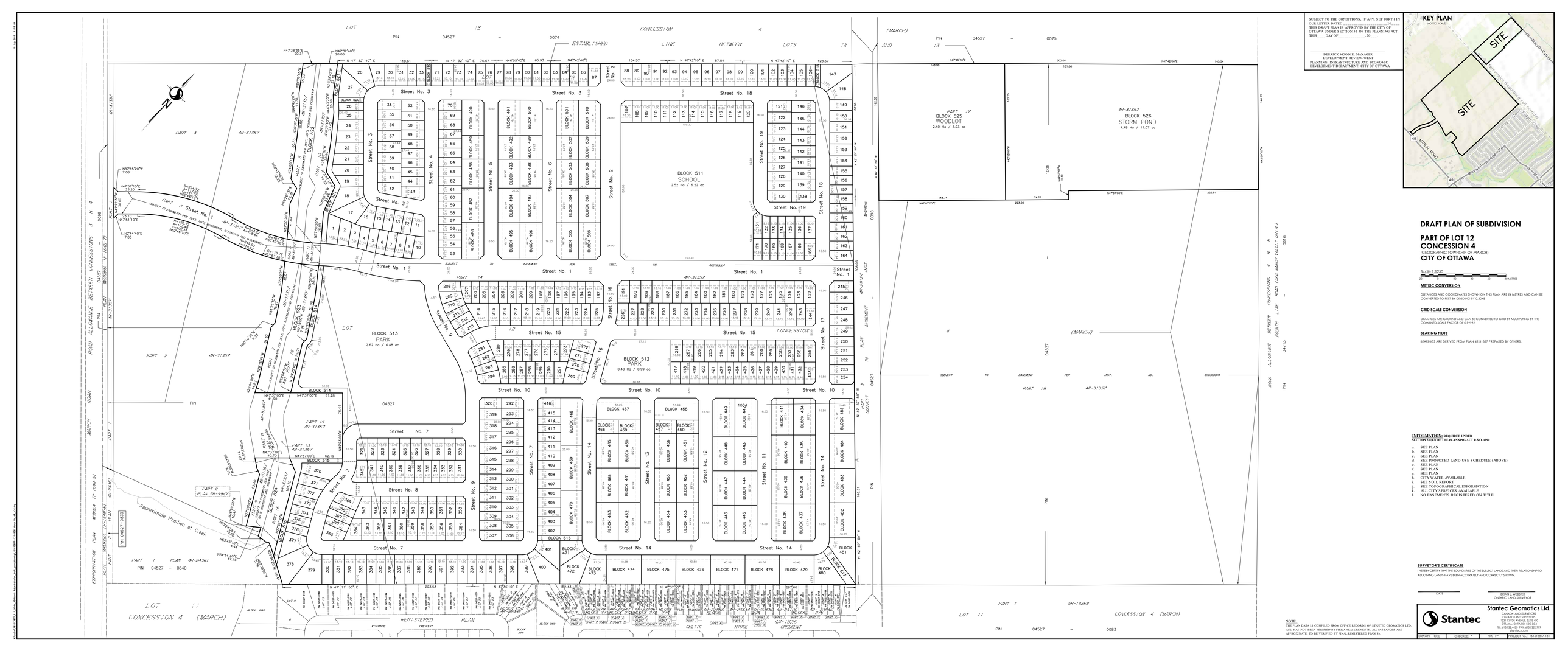
Project:
Kanata North (Fuller)
936 March Road, Ottawa, ON

Title:
Concept 13

Drawing:
CP-13

Scale:
NTS

minto Communities
Minto Communities Inc.
200-180 Kent Street
Ottawa, ON K1P 0B6
Canada



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
NOT TO SCALE

DRAFT PLAN OF SUBDIVISION

PART OF LOT 12
CONCESSION 4
(GEOGRAPHIC TOWNSHIP OF MARCH)
CITY OF OTTAWA

Scale 1:1250
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

GRID SCALE CONVERSION

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.9999

BEARING NOTE

BEARINGS ARE DERIVED FROM PLAN 4R-31357 PREPARED BY OTHERS.

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. NO EASEMENTS REGISTERED ON TITLE

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:
THE 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).

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ONTARIO LAND SURVEYORS
1331 CLYDE AVENUE, SUITE 400
OTTAWA, ONTARIO, K2C 3G4
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stantec.com

DRAWN: CJC	CHECKED: *	PM: FP	PROJECT NO.: 161613077-131

1.5 Agency Consultation

Ottawa City Council has previously approved the KNUEA Community Design Plan (CDP) and Environmental Management Plan (EMP). The recommendations of the KNUEA CDP and EMP are referred to throughout this report. The Mississippi Valley Conservation Authority (MVCA) was consulted as part of the KNUEA CDP and EMP process. The proponent has discussed the current development proposal with the City, and the MVCA was circulated as part of the development application review. The Ontario Ministry of Natural Resources and Forestry (OMNRF) was extensively consulted as part of the urban expansion process, particularly with regards to the *Kanata North Community Design Plan – Blanding's Turtle Habitat Compensation Plan* (DST 2015). As discussed in detail in Section 3.7.3, the extent of Blanding's Turtle habitat and intended habitat retention within the KNUEA has previously been determined in consultation with the OMNRF. As noted below, it is anticipated that an Overall Benefit Permit(s) under Clause 17(2)(C) of the Ontario Endangered Species Act (ESA) will be required to support the undertaking. In future, extensive consultation and review will be undertaken with the Ministry of Environment, Climate Change, and Parks (MECP) as part of the ESA permitting process. It should be noted that in early 2019, the responsibility for administering the Ontario ESA was transitioned from the OMNRF to the MECP. Throughout this report, discussions that occurred with the OMNRF, and technical documents that are authored by the OMNRF, continue to be referenced to the OMNRF. As noted throughout this report, it is anticipated that all future Ontario ESA related discussions will be undertaken with the MECP.

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):** Habitat for Blanding's Turtle (threatened), habitat for Butternut Trees (endangered), and individual Butternut Trees are known to occur within the Study Area. As such, an Overall Benefit Permit(s) under Clause 17(2)(C) of the ESA will be required to support development. Due to the fact that many areas of Butternut and Blanding's Turtle habitat are overlapping within the Study Area, it is anticipated that both species will be addressed through a combined permit(s) application. Depending on the schedule of development, the Ontario Endangered Species Act requirements for the development of the Southeast Quadrant of the KNUEA may be addressed either by obtaining separate Overall Benefit Permits for the development of the Commercial Blocks and the Minto Site, or by obtaining a single combined permit for the entire quadrant. The permitting approach will be determined in future through discussion with the landowners and the MECP.
- **Ontario Regulation 153/06:** Ontario Regulation 153/06 regulates activities that alter shorelines, watercourses, and wetlands. O.Reg. 153/06 regulates the area up to 30 m from the normal high-water mark of a watercourse. The 40 m wide North Tributary and North Branch watercourse corridors will not preserve the full 30 m regulated area surrounding these features (which would require a 60 m wide corridor). In addition, the construction of Street #1 will require installation of a new culvert. As discussed below, habitat enhancement features are intended to be installed within the 40 m wide North Tributary watercourse corridor, thereby overlapping the area regulated under O. Reg. 153/06. As such, the development of both the Commercial Blocks and the Minto Site, as well as the installation of the proposed habitat enhancement features, will require obtainment of a permit(s) from the Mississippi Valley Conservation Authority (MVCA) under O.Reg 153/06.
- **Fisheries Act:** The North Tributary within the Study Area will not be realigned as part of the proposed development. The entire length of the North Tributary through the Study Area is intended to be retained. Habitat enhancement features will include off-line features installed adjacent to the existing channel (discussed below) within the 40 m wide watercourse corridor, thereby avoiding the need for significant in-water work. As such, there are no significant impacts to fish habitat anticipated as a result of the development, and therefore a review under the Fisheries Act is not anticipated to be required.
- **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. The Tree Removal Permit is typically issued following acceptance of the TCR.

2.0 METHODOLOGY

2.0.1 Vegetation Survey and Tree Inventory Methodology (TCR)

Site visits to inventory plants and measure tree sizes were completed by Dr. McKinley on May 8th, June 8th, and June 21st, 2018. 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.

Vegetation communities within the Study Area were classified following the Ecological Land Classification (ELC) methodology (OMNRF 1998; Lee 2008). This included a three (3) season plant inventory to document the occurrence of plants, create a master plant list, and to identify and delineate plant communities. Tree measurements were completed in areas of continuous tree cover by undertaking TCR sampling plots, whereas linear transects were employed to inventory the Coniferous Hedgerows and Deciduous Hedgerows. 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 treed portions of the Study Area to achieve the desired density of 1 plot per hectare. Hedgerows are too narrow to allow sampling using plots. Instead, transects were employed to sample the hedgerows. Each transect was 20 m long and every tree with 10 cm dbh or greater along the transect was measured. The number of plots and transects undertaken in each vegetation community is listed below in Tables A to F (Section 3.3). Trees within each plot/transect that were 10 cm dbh or greater in size were measured with the use of a D-tape, which is a calibrated dbh tape.

Vegetation communities were previously surveyed and classified by Muncaster Environmental Planning (MEP) as part of the Existing Conditions Report, which was prepared to support the Kanata North Urban Expansion Area (KNUEA) approval process (MEP 2016). Vegetation surveys completed by MEP were undertaken on May 3rd, June 19th, and June 21st 2013. Additional surveying of Woodlot S-23 was undertaken on June 5th, 2014 and May 14th, June 9th, June 10th, and June 18th, 2015 (MEP 2016). As noted below, the plant survey results, plant lists, tree sizes, and vegetation mapping completed by MEP (2016) have been reviewed and integrated throughout this report.

During the Draft Plan of Subdivision application review process, the City of Ottawa requested completion of a large tree inventory for Woodlot S-23. Portions of Woodlot S-23 occur in both the Northeast and Southeast Quadrants of the KNUEA, and therefore the requirement for a large tree

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inventory applies to both the 936 March Road and the 1020/1070 March Road properties. The large tree inventory was completed in June 2019, and identifies the location, condition, and species of trees ≥50 cm dbh in size within Woodlot S-23. The results of the large tree inventory will help guide the detailed design process for the Stormwater Management Pond. The large tree inventory has been submitted to the City of Ottawa under separate cover.

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2.0.2 EIS Methodology

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

- Site surveys to describe vegetation communities and inventory trees (see above);
- 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;
- Review of the Kanata North Urban Expansion Area (KNUEA) Existing Conditions Report (MEP 2016), the KNUEA Community Design Plan (CDP) (Novatech 2016a), and the KNUEA Environmental Management Plan (EMP) (Novatech 2016b), as well as associated background environmental reports;
- Review of existing Blanding's Turtle habitat mapping for the area (DST 2015);
- Examination of aerial imagery to evaluate landscape features;
- Natural Heritage Information Center (NHIC) database review (OMNRF 2018);
- Obtainment of an Information and Records Request Response from the OMNRF (Appendix E);
- Review of Official Plan designations; and
- Review of background geotechnical report (Paterson 2013).

Detailed assessments of natural heritage features were completed as follows:

- **Plant Inventory and ELC Classification:** See description above.
- **Bird Point Counts (Barn Swallow, Bobolink, Eastern Meadowlark):** Breeding bird surveys were completed in 2013 and 2015 to support the EMP, during which Bobolink and Barn Swallows were noted within some areas of the KNUEA (MEP 2016). Updated surveying to confirm the presence/absence of Bobolink, Eastern Meadowlark, Barn Swallows, and other bird species was completed on May 29th, June 8th, and June 21st, 2018. Weather conditions included temperatures of 19 ºC, 17 ºC, and 14 ºC (respectively), with sunny conditions during each survey day. Surveys were completed following the OMNRF *Wildlife Monitoring Programs and Inventory Techniques - Technical Manual* (Konze & McLaren 1998) Breeding Bird Survey (BBS) method. The survey timing followed the requirements outlined in the OMNRF *Survey Methodology under the Endangered Species Act: Dolichonyx oryzivorus (Bobolink)* (OMNRF 2011a). Bird survey points are shown in Figure 5 (below).
- **Barn Swallow and Chimney Swift:** The farmhouse located at 936 March Road has been identified for retention within a separate parcel that surrounds the house, its yard, and the adjacent agricultural buildings. This parcel includes the house as well as all of the surrounding agricultural buildings, such that there are no buildings present within the Minto Site and the Commercial Blocks. All exterior surfaces and all accessible interior surfaces of the buildings surrounding the farmhouse were inspected visually for the presence of Barn Swallow nests on

May 8th, 2018. As discussed below in Section 3.7.4, no evidence of Barn Swallow nesting was noted. This is likely due to the fact that most of the buildings are heavily shaded and/or obscured by the Cultural Woodlot (Feature S), and Barn Swallows typically prefer to nest in buildings in open areas (discussed in Section 3.7.4) (SARO 2018). The farmhouse at 936 March Road has the only chimney found within the Study Area, and the chimney has a metal cap, thereby preventing Chimney Swift nesting. Due to the absence of potentially suitable chimneys within the Study Area, a survey for Chimney Swifts was not required.

- **Butternut Trees:** Butternut Trees were documented in several locations throughout the Study Area during the KNUEA approval process (MEP 2016). In order to address the presence of Butternut Trees, an updated Butternut Health Assessment (BHA) was completed throughout the Study Area in 2018. The BHA is included in Appendix D. Refer to Appendix D for additional detail regarding the BHA methodology.
- **Blanding's Turtle:** Detailed Blanding's Turtle surveying was completed in 2014 to support the KNUEA EMP (MEP 2016). The results of the Blanding's Turtle surveys were reviewed in consultation with the OMNRF, and the extent of Blanding's Turtle habitat within the KNUEA was extensively studied. Consultation with the OMNRF culminated in acceptance of Blanding's Turtle habitat mapping which shows the extent of habitat throughout the KNUEA (DST 2015). There have been no significant changes to the Blanding's Turtle habitat since completion of the habitat mapping exercise, and therefore additional Blanding's Turtle surveys and habitat mapping is not required. For the purposes of this Combined Environmental Impact Statement (EIS) and Tree Conservation Report (TCR), as well as the future Overall Benefit Permit application, the Blanding's Turtle habitat mapping that was previously reviewed and approved by the OMNRF will be utilized (DST 2015). The previously completed habitat mapping is included below in Section 3.7.3.
- **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 Study Area. 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. Furthermore, the OMNRF guidelines state that potential cavity/snag trees must be at least 25 cm diameter at breast height (dbh) in size to potentially provide maternity roosting habitat. Suitable forest areas within the Study Area were surveyed for potential maternity roosting habitat by counting snags/cavity trees. The survey was completed on May 8th, 2018 prior to leaf-out.
- **Whip Poor Will Call Surveys:** Whip Poor Will call surveys were completed throughout the KNUEA in 2014 to support the KNUEA EMP, and no evidence of Eastern Whip Poor Will was noted (MEP 2016). Whip Poor Will surveys were updated in 2018 by completing a survey following the

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OMNRF (2014d) *Draft Survey Protocol for Eastern Whip Poor Will*. This 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 22nd, May 29th, and June 22nd, 2018. Survey locations are shown below in Figure 9. Survey weather conditions and results are summarized below in Table G.

- **Shirley's Brook and Fish Habitat:** In 2013, fish sampling was completed at five (5) locations along the North Tributary of Shirley's Brook (referred to as Tributary #2 in the EMP), and the quality of aquatic habitat was described to support the EMP (MEP 2016). Walkthroughs of the tributaries of Shirley's Brook within the Study Area were also completed by MES in the spring and summer of 2018. This information was utilized to assess the aquatic habitat features for the purposes of this Combined EIS and TCR. Due to the fact that the development of the Minto Site and the Commercial Blocks will not involve the realignment and/or removal of the North Tributary, a Headwaters Drainage Assessment (HDA) for the North Tributary is not anticipated to be required. MEP completed a HDA to address the Ephemeral Farm Drainage Channels in the eastern part of the Study Area (MEP 2015). The HDA is included in Appendix C. Site visits for the HDA were completed by MEP on June 23rd, 2014, and May 21st, June 2nd, and July 27th, 2015. Fish sampling within the Ephemeral Farm Drainage Channels was completed by MEP in 2014 and 2015 (MEP 2015). Refer to Appendix C for additional detail regarding the methodology used.

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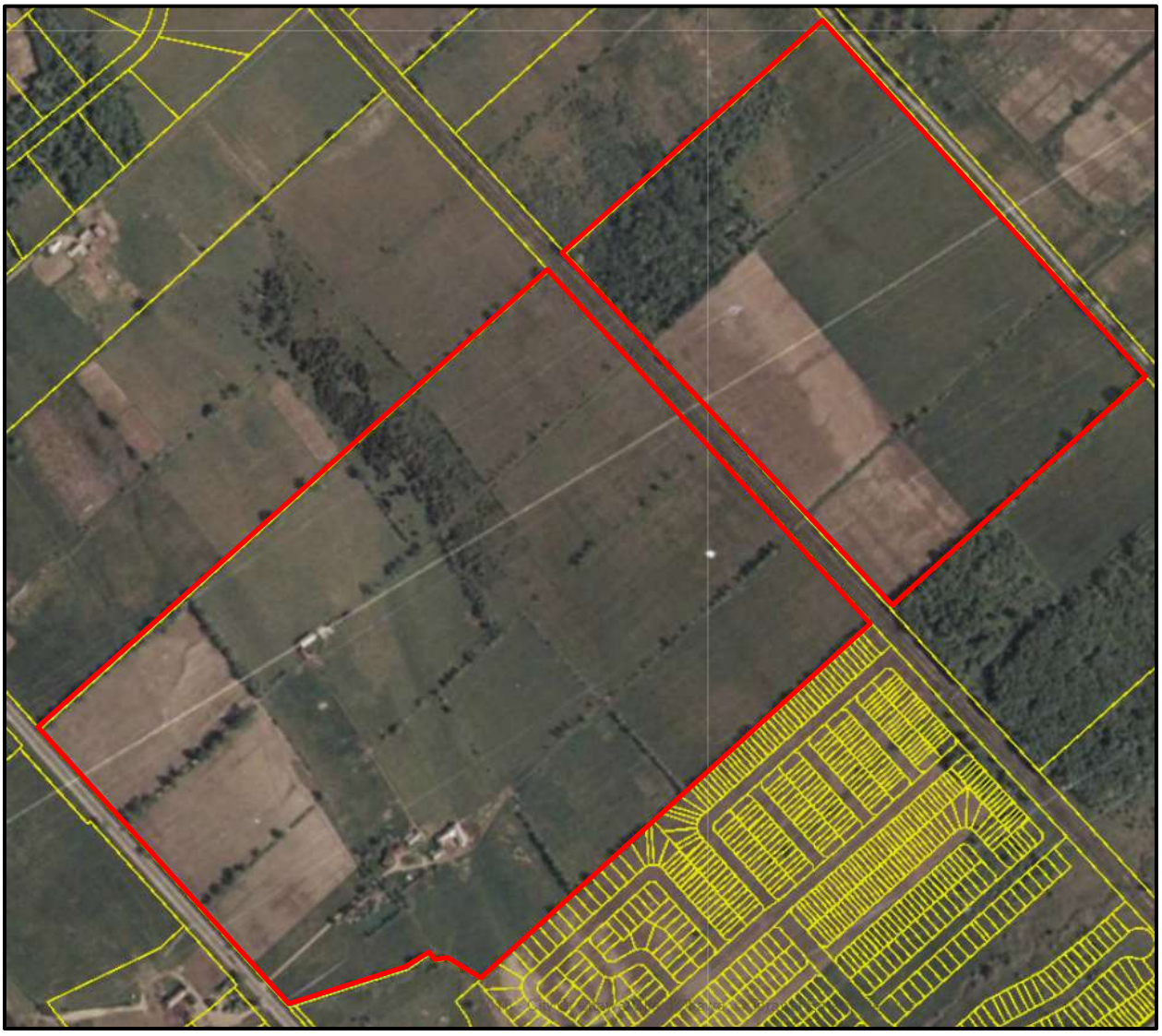
3.0 EXISTING CONDITIONS

3.1 Geological Conditions

The western part of the Study Area has a gradual slope from approximately 80 m ASL at March Road to approximately 78 m ASL at the existing farmhouse at 936 March Road. East of the existing farmhouse the Study Area slopes downwards to approximately 70 m ASL at the Former CN Railway Corridor. East of the railway corridor, the Study Area continues to slope downwards to approximately 66 m ASL at March Valley Road. Surface drainage within the Study Area is hence primarily west to east, although the North Tributary flows from north to south through the Study Area. Paterson Group (2013) note that within the 936 March Road property, subsoil conditions consist of topsoil, agricultural soil, or fill underlain by a stiff to very stiff silty clay deposit. Glacial till was noted below the silty clay in the southern portion of the property. Paterson Group (2013) note that based on available geological mapping, the bedrock conditions below the majority of the Study Area consists of interbedded sandstone and dolomite of the March formation. The overburden thickness varies from 0 m to 10 m depth through the majority of the Study Area.

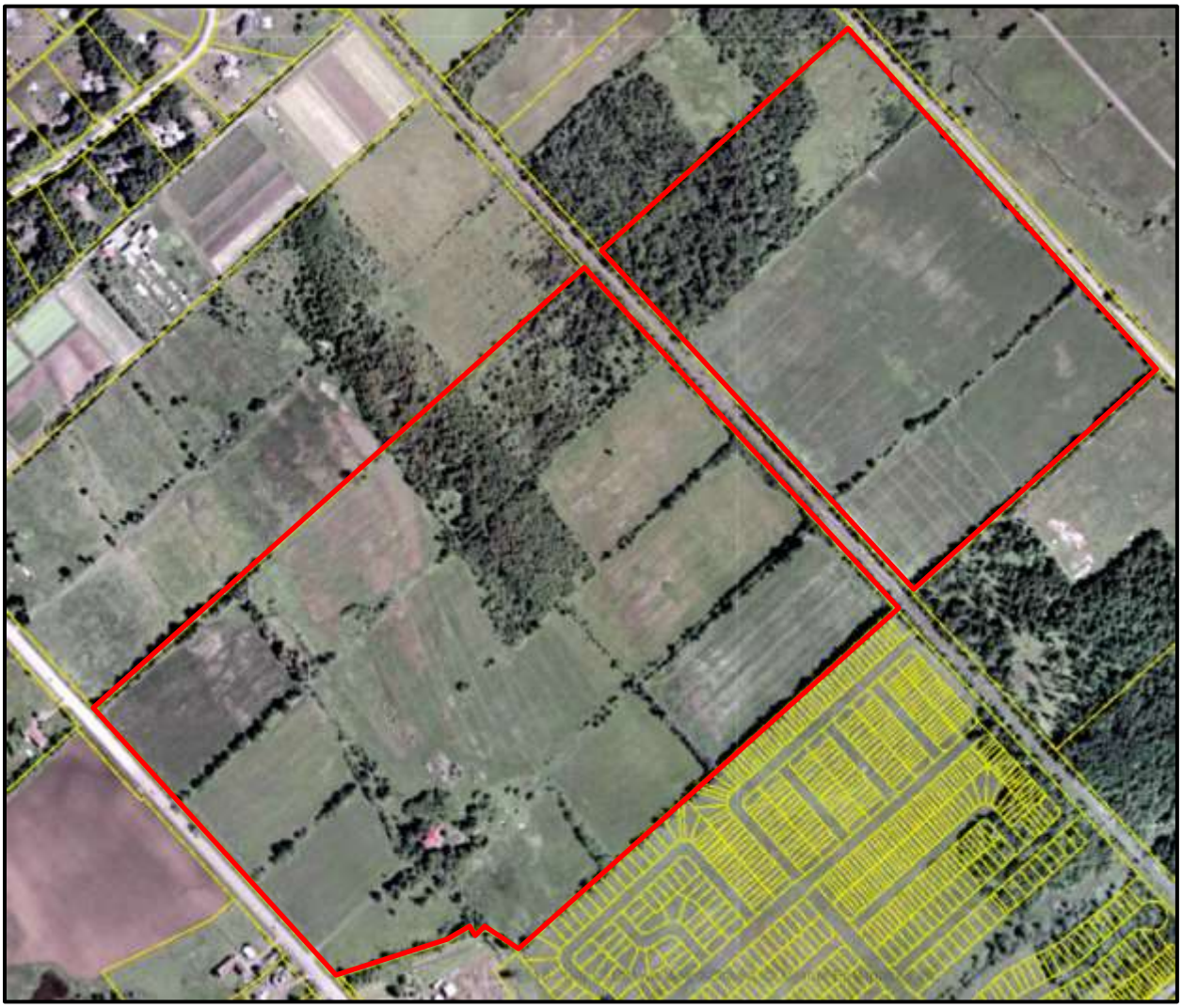
3.2 Study Area History (TCR)

Air photos from 1976, 1991 and 2005 are included below (Photos from City of Ottawa 2018). Recent air photos are included in the report figures. The oldest available historic air photo (from 1976), shows that the overall composition of the Study Area was similar in 1976, with most of the Study Area intensively farmed. In 1976, the western portions of both Woodlot S-20 and Woodlot S-23 are present, however, the eastern portion of both features and the southern portion of Woodlot S-20 appear to be largely clear of tree cover. The Cultural Woodlot surrounding the farmhouse at 936 March Road is also largely absent. This suggests that the western portions of both Woodlot S-20 and Woodlot S-23 are more than 40 years old (approximately), however, the remainder of these features and the Cultural Woodlot surrounding the farmhouse are younger than 40 years old (approximately). By 1991, the Study Area remained largely unchanged, although the Cultural Woodlot surrounding the farmhouse at 936 March Road expanded by 1991. This suggests that the oldest trees within the Cultural Woodlot are approximately 20 to 30 years old. By 2005, the eastern and southern portions of Woodlot S-20 are visibly regenerating. This suggests that much of the tree cover within the eastern and southern portions of Woodlot S-20 is approximately 10 to 20 years old. However, the area east of Woodlot S-23 remains largely clear of tree cover. The Cultural Woodlot surrounding the farmhouse at 936 March Road is similar to its current size in 2005.



Historic Air Photograph 1: Historic Air Photo from 1976 (Study Area limits shown in red). Note the overall composition of the Study Area was similar in 1976, with most of the Study Area intensively farmed. The western portions of both Woodlot S-20 and Woodlot S-23 are present in 1976, however, the eastern portion of both features and the southern portion of Woodlot S-20 appear to be largely clear of tree cover. The Cultural Woodlot surrounding the farmhouse at 936 March Road is largely absent (Photos from City of Ottawa 2018).

Historic Air Photograph 2: Historic Air Photo from 1991 (Study Area limits shown in red). Note the overall composition of the Study Area was similar in 1991, with most of the Study Area intensively farmed. The western portions of both Woodlot S-20 and Woodlot S-23 are present in 1991, however, the eastern portion of both features continues to be largely absent in 1991. The southern portion of Woodlot S-20 is also largely absent. The Cultural Woodlot surrounding the farmhouse at 936 March Road has expanded by 1991 (Photos from City of Ottawa 2018).



Historic Air Photograph 3: Historic Air Photo from 2005 (Study Area limits shown in red). Note the overall composition of the Study Area was similar in 2005, with most of the Study Area intensively farmed. The western portions of both Woodlot S-20 and Woodlot S-23 are present in 2005. By 2005, the eastern and southern portions of Woodlot S-20 are visibly regenerating. However, the area east of Woodlot S-23 remains largely clear of tree cover. The Cultural Woodlot surrounding the farmhouse at 936 March Road is similar to its current size in 2005 (Photos from City of Ottawa 2018).

3.3 Vegetation Communities (TCR)

The Study Area is an agricultural landscape dominated by Cultivated Fields planted with soybeans and recently fallow agricultural fields (Graminoid Meadow). Treed areas include several Deciduous and Coniferous Hedgerows, a Cultural Woodlot surrounding the farmhouse at 936 March Road, Woodlot S-20 and the surrounding areas of recent regrowth, and Woodlot S-23 and the surrounding areas of recent regrowth. ELC communities found within the Study Area include the following:

- Previously Developed Areas;
- Coniferous Hedgerows (Features A & B);
- Deciduous Hedgerows (Features C to Q);
- Riparian Vegetation (Feature R);
- Cultural Woodlot (Feature S);
- Woodlot S-20 and Surrounding Recent Regrowth (Features T to W);
    - Fresh-Moist Ash Poplar Deciduous Forest (Feature T);
    - Fresh-Moist White Cedar Coniferous Forest / White Cedar Coniferous Swamp (Feature U)
    - Cultural Thicket (Feature V)
    - Fresh-Moist Poplar Deciduous Forest (Feature W)
- Woodlot S-23 and Surrounding Recent Regrowth (Features W to Z);
    - Fresh-Moist Poplar Deciduous Forest (Feature W)
    - Fresh-Moist White Cedar - Hardwood Mixed Forest (Feature X)
    - Dry-Fresh Sugar Maple – Ash Deciduous Forest (Feature Y)
    - Cultural Thicket (Feature Z);
- Cultivated Fields; and
- Recently Fallow Fields (Graminoid Meadow).

The extent of these vegetation communities is shown in Figures 2 and 3. Appendix A includes a list of plant species noted during the vegetation surveys. Each of the vegetation communities is described in greater detail below.

3.3.1 Previously Developed Areas

The only areas of significant previous development within the Study Area includes the driveway, yard, and farmhouse at 936 March Road, as well as the surrounding agricultural buildings. Including the house itself, there are a total of seven (7) existing buildings. All of the existing buildings found within the Study Area are contained within the parcel that has been retained around the existing farmhouse at 936 March Road. Therefore, there are no existing buildings within the Minto Site and the Commercial Blocks. Refer to Section 3.7.4 for a detailed description of the existing buildings.

3.3.2 Treed Habitats and Tree Inventory (TCR)

The following is a summary of the treed habitats found within the Study Area. A tree inventory was completed in all treed areas. Treed habitats are shown below in Figure 2.

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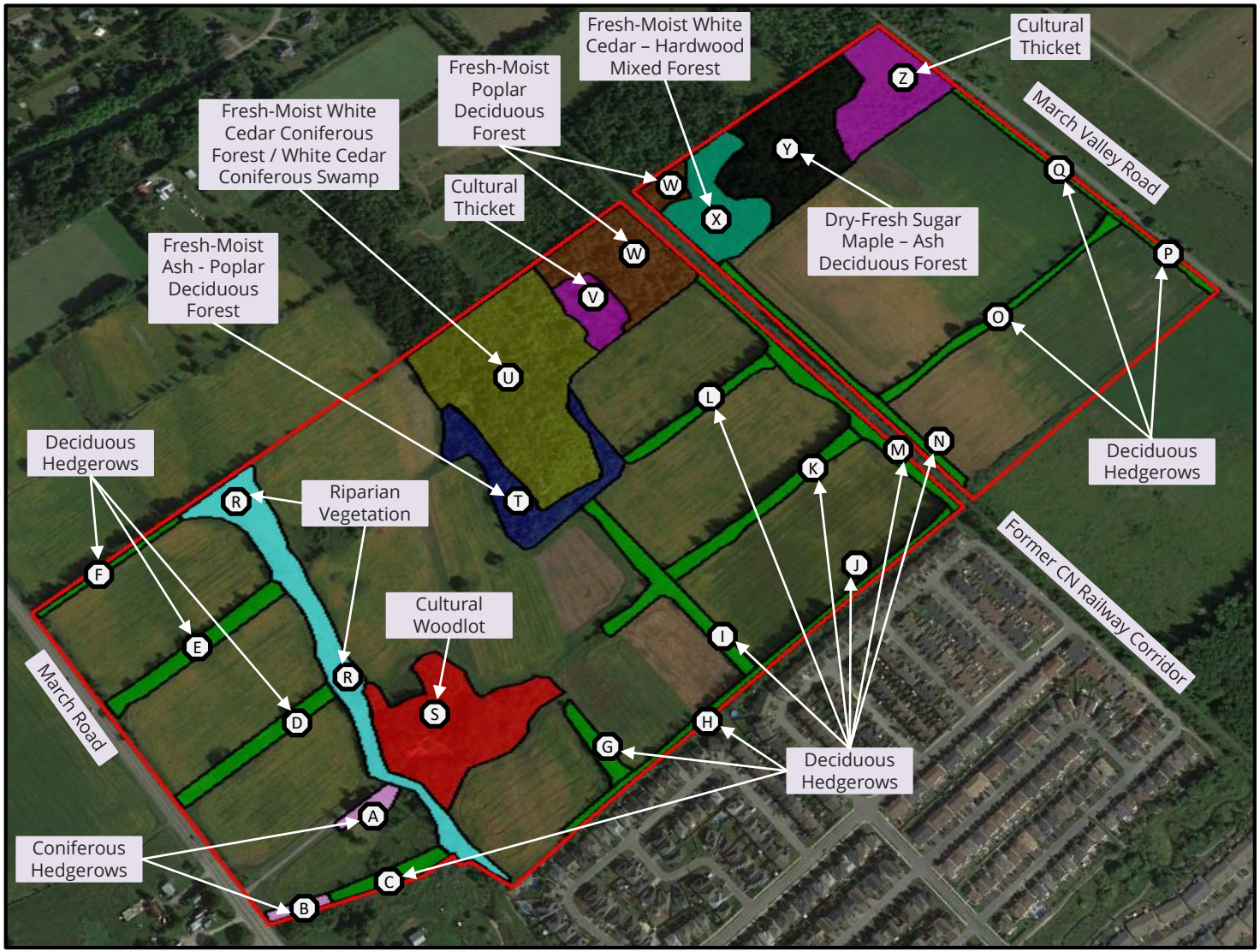
FIGURE 2: TREED HABITATS

Minto Communities & 2559688 Ontario Inc.
Kanata North Development (936 March Road) - Combined EIS & TCR (Revised)



- Study Area (H) - Vegetation Feature Number

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

Coniferous Hedgerows (Features A & B)

There were two (2) Coniferous Hedgerows identified within the Study Area. Coniferous Hedgerows are shown in Figure 2. Tree size measurements for the Coniferous Hedgerows are described below:

- **Coniferous Hedgerow A:** Feature A is a row of approximately twelve (12) White Cedars that are present along the south side of the driveway leading up to the 936 March Road farmhouse. The White Cedars range in size from 27 cm to 73 cm dbh.
- **Coniferous Hedgerow B:** Coniferous Hedgerow B includes an overgrown line of Scots Pine (up to 25 cm dbh) which are present adjacent to March Road. Sugar Maple and Tamarack up to 30 cm dbh are also present. Further east, the feature transitions to a Deciduous Hedgerow (Deciduous Hedgerow C).

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Photograph 1: Looking east at the Coniferous Hedgerow (Feature A) (May 8th, 2018).

Photograph 2: Looking south at the Coniferous Hedgerow (Feature B) (at right). The Deciduous Hedgerow (Feature C) is shown in the center and left (May 8th, 2018).

Deciduous Hedgerows (Features C to Q)

There are fifteen (15) Deciduous Hedgerows within the Study Area. Deciduous Hedgerows are shown in Figure 2 and tree sizes are shown in Tables A and B. As noted below, the species composition of the Deciduous Hedgerows varies throughout the Study Area. White/Green Ash are the dominant species in Deciduous Hedgerows C to F, G to J, and P & Q. Virtually all White/Green Ash over 20 cm dbh in size are either dead or severely stressed as a result of the effects of the invasive Emerald Ash Borer. This die-off of large Ash trees has significantly degraded the hedgerows. Sugar Maple and Trembling Aspen are the dominant species in Deciduous Hedgerow K, while Deciduous Hedgerows L, M and N are dominated by Trembling Aspen. Deciduous Hedgerow O is dominated by American Elm and Bur Oak. Other trees that are common throughout the Deciduous Hedgerows include Bur Oak, Manitoba Maple, American Elm, American Basswood, Sugar Maple, Domestic Apple and Black Cherry. White Cedar, White Birch, and White Pine are also present but are less common. All of the Deciduous Hedgerows include thick shrub cover including regenerating Ash and Manitoba Maple stems, Common Buckthorn, Common Apple, Prickly Ash, Tartarian Honeysuckle, Choke Cherry, Hawthorn, Wild Red Raspberry, and Riverbank Grape. Groundcover is reflective of disturbed conditions and includes various grasses, Dandelion, Poison Ivy, Virginia Creeper, Common Milkweed, Canada Goldenrod, Common Strawberry, Common Ragweed, and Red and White Clover. Exceptionally large trees within each hedgerow were measured, but are omitted from the tree inventory listed in Table A and B, as the larger trees would skew the average for the hedgerows, which would make the average tree size appear larger than it is in reality. Instead, exceptionally large trees are identified below. The following headings provide additional detail regarding the Deciduous Hedgerows:

- **Deciduous Hedgerows C to F:** As noted above, White/Green Ash are the dominant trees within Deciduous Hedgerows C to F. Sugar Maple, Bur Oak, and Trembling Aspen are also well represented. Exceptionally large trees include a 107 cm dbh Bur Oak and a 96 cm dbh White Ash (declining) found within Deciduous Hedgerow F. Deciduous Hedgerow E also includes an 86 cm dbh Sugar Maple, a 91 cm dbh Sugar Maple, and a 96 cm dbh White Ash (declining).
- **Deciduous Hedgerows G to J:** White/Green Ash make up approximately 80% of Deciduous Hedgerows G to J. As a result, these features are highly degraded, with the majority of stems either dead or in significant decline. Deciduous Hedgerow J includes a 99 cm dbh Bur Oak. It should be noted that following a windstorm in the spring of 2018, many dead/dying White/Green Ash within Deciduous Hedgerow H and J fell over. The City of Ottawa Bylaw and Regulatory Services Department issued a letter to Minto Communities (dated May 8th, 2018) which identified the presence of dead White/Green Ash trees along the southern property line. The dead/dying White/Green Ash trees represented a concern, as they were present along the southern property line adjacent to the existing subdivision located to the south. Minto Communities responded to

the City of Ottawa's letter by retaining a contractor to remove any dead/dying White/Green Ash trees. Tree removal was completed in June 2018. MES was asked by Minto Communities to prepare a letter documenting the rationale for tree removal and the condition of trees at the time. This letter is included in Appendix F. It should be noted that the tree inventory outlined below in Table A was completed before tree removal. Since completion of the tree inventory, the majority of White/Green Ash trees have been removed from Deciduous Hedgerows H and J.

- **Deciduous Hedgerow K:** Deciduous Hedgerow K is dominated by Sugar Maple and Trembling Aspen, with several Butternut Trees present.
- **Deciduous Hedgerow L:** Deciduous Hedgerow L is dominated by Trembling Aspen.
- **Deciduous Hedgerows M & N:** Deciduous Hedgerows M & N are present on either side of the Former CN Railway Corridor. Tree cover is dominated by thick stands of Trembling Aspen with a dense understory of Prickly Ash and Common Buckthorn.
- **Deciduous Hedgerow O:** Deciduous Hedgerow O includes a mixture of American Elm and Bur Oak. The hedgerow is generally sparse, and includes one (1) large American Elm with seven (7) branching trunks that vary in size between 42 cm and 50 cm dbh.
- **Deciduous Hedgerows P & Q:** Deciduous Hedgerows P & Q include a mixture of White/Green Ash and Bur Oak. Both features are heavily overgrown with Common Buckthorn.

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Table A: Deciduous Hedgerows (Part 1)

Common Name	Scientific Name	Average DBH	DBH Standard Deviation	% Occupancy	Estimated Stems Per Hectare*
Deciduous Hedgerow - Features C to F (4 Transects)					
White/Green Ash	*Fraxinus americana/pennsylvanica*	32	15	38%	750
Sugar Maple	*Acer saccharum*	14	3	18%	350
Bur Oak	*Quercus macrocarpa*	34	17	18%	350
Trembling Aspen	*Populus tremuloides*	34	8	10%	200
Manitoba Maple	*Acer negundo*	12	1	8%	150
Black Cherry	*Prunus serotina*	49	0	5%	100
Domestic Apple	*Malus sylvestris*	12	N/A	3%	50
American Elm	*Ulmus americana*	44	N/A	3%	50
Deciduous Hedgerow - Features G to J (4 Transects)					
White/Green Ash	*Fraxinus americana/pennsylvanica*	28	9	80%	1850
American Elm	*Ulmus americana*	18	13	13%	300
Bur Oak	*Quercus macrocarpa*	19	10	4%	100
Manitoba Maple	*Acer negundo*	28	N/A	2%	50
Deciduous Hedgerow - Feature K (1 Transect)					
Sugar Maple	*Acer saccharum*	30	22	38%	1200
Trembling Aspen	*Populus tremuloides*	14	6	31%	1000
Butternut	*Juglans cinerea*	16	8	13%	400
White/Green Ash	*Fraxinus americana/pennsylvanica*	18	N/A	6%	200
Bur Oak	*Quercus macrocarpa*	22	N/A	6%	200
American Elm	*Ulmus americana*	24	N/A	6%	200
Deciduous Hedgerow - Feature L (1 Transect)					
Trembling Aspen	*Populus tremuloides*	17	4	80%	1600
White/Green Ash	*Fraxinus americana/pennsylvanica*	17	1	20%	400

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.

*Note: Hedgerow tree density measured using 20 m x 2.5 m long transects, other areas measured using 5 m x 10 m plots.

**Exceptionally large tree specimens in the hedgerows were measured and are described in the text (above). However, they are not included here, as they disproportionately affect the average tree size.

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Table B: Deciduous Hedgerows (Part 2)					
Common Name	**Scientific Name**	**Average DBH**	**DBH Standard Deviation**	**% Occupancy**	**Estimated Stems Per Hectare***
Deciduous Hedgerow - Features M & N (2 Transects)					
Trembling Aspen	*Populus tremuloides*	30	10	89%	1700
White/Green Ash	*Fraxinus americana/pennsylvanica*	18	N/A	5%	100
American Elm	*Ulmus americana*	10	N/A	5%	100
Deciduous Hedgerow - Feature O (1 Transect)					
American Elm	*Ulmus americana*	45	3	54%	1400
Bur Oak	*Quercus macrocarpa*	36	20	46%	1200
Deciduous Hedgerow - Features P & Q (2 Transects)					
White/Green Ash	*Fraxinus americana/pennsylvanica*	26	10	53%	900
Bur Oak	*Quercus macrocarpa*	25	8	41%	700
Sugar Maple	*Acer saccharum*	23	N/A	6%	100

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.

*Note: Hedgerow tree density measured using 20 m x 2.5 m long transects, other areas measured using 5 m x 10 m plots.

**Exceptionally large tree specimens in the hedgerows were measured and are described in the text (above). However, they are not included here, as they disproportionately affect the average tree size.

Photograph 3: Looking south at the Deciduous Hedgerow (Feature C), shown in center and left. The Coniferous Hedgerow (Feature B) is visible (at right) (May 8th, 2018).

Photograph 4: Looking north at the Deciduous Hedgerow (Feature D). A 107 cm dbh Bur Oak and a 96 cm dbh White Ash are visible in the middle of the photograph (May 8th, 2018).

Photograph 5: Looking north at the Deciduous Hedgerow (Feature E). An 86 cm dbh Sugar Maple, a 91 cm dbh Sugar Maple, and a 96 cm dbh White Ash are visible in the center and right of the photograph (May 8th, 2018).

Photograph 6: Looking north at the Deciduous Hedgerow (Feature F) (May 8th, 2018).

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Photograph 7: Looking west at the Deciduous Hedgerow (Feature G) (June 8th, 2018).

Photograph 8: Looking south at the Deciduous Hedgerow (Feature H) (May 8th, 2018).

Photograph 9: Looking east at the Deciduous Hedgerow (Feature I) (May 8th, 2018).

Photograph 10: Looking south at the Deciduous Hedgerow (Feature J) (May 8th, 2018).

Photograph 11: Looking north at the Deciduous Hedgerow (Feature K) (May 8th, 2018).

Photograph 12: Looking north at the Deciduous Hedgerow (Feature L) (May 8th, 2018).

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Photograph 13: Looking east at the Deciduous Hedgerow (Feature M) (May 8th, 2018).

Photograph 14: Looking west at the Deciduous Hedgerow (Feature N) (May 8th, 2018).

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Photograph 15: Looking north at the Deciduous Hedgerow (Feature O) (June 8th, 2018).

Photograph 16: Looking east at the Deciduous Hedgerow (Feature P) (May 8th, 2018).

Photograph 17: Looking west at the Deciduous Hedgerow (Feature Q) from March Valley Road (May 8th, 2018).

Riparian Vegetation (Feature R)

A corridor of Riparian Vegetation (Feature R) exists surrounding the North Tributary. Tree cover is dominated by White/Green Ash and Manitoba Maples. However, several large Crack Willows are present, most of which are 60 cm to 80 cm dbh in size, although some specimens up to 150 cm dbh are also present. The Crack Willows are not native species, and were likely planted as landscaping features along the creek. Shrub cover includes Wild Red Raspberry, Common Buckthorn and Tartarian Honeysuckle. Groundcover is dominated by Reed Canary Grass with Purple Loosestrife, Spotted Touch Me Not, and Common Cattail present.

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Table C: Riparian Vegetation					
Common Name	**Scientific Name**	**Average DBH**	**DBH Standard Deviation**	**% Occupancy**	**Estimated Stems Per Hectare***
Riparian Vegetation - Feature R (1 Transect)					
White/Green Ash	*Fraxinus americana/pennsylvanica*	20	5	67%	1600
Manitoba Maple	*Acer negundo*	15	4	33%	800

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.

*Note: Hedgerow tree density measured using 20 m x 2.5 m long transects, other areas measured using 5 m x 10 m plots.

**Exceptionally large tree specimens in the hedgerows were measured and are described in the text (above). However, they are not included here, as they disproportionately affect the average tree size.

Photograph 18: Looking east at the large Crack Willows (60 cm to 80 cm dbh) present in the Riparian Vegetation (Feature R) surrounding the North Tributary (May 8th, 2018).

Photograph 19: Looking west at the Riparian Vegetation (Feature R) (June 21st, 2018).

Cultural Woodlot (Feature S)

A Cultural Woodlot (Feature S) is present around the farmhouse at 936 March Road. The Cultural Woodlot creates a partially enclosed canopy which shades most of the agricultural buildings surrounding the farmhouse. The Cultural Woodlot is dominated by Manitoba Maple, although White/Green Ash are well represented. Notably, a high density of Butternut Trees was noted within the Cultural Woodlot. A large portion of the Cultural Woodlot feature is contained within the parcel surrounding the 936 March Road farmhouse. However, portions of the Cultural Woodlot, including many of the Butternut Trees, also overlap the Minto Site. Groundcover is generally sparse and consists of mowed lawn in many areas. This condition is artificial, resulting from maintenance work completed by the residents at 936 March Road. The edges of the feature include some unmaintained thicket areas, which include dense stands of Wild Red Raspberry, Riverbank Grape and Common Buckthorn.

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Table D: Cultural Woodlot					
Common Name	**Scientific Name**	**Average DBH**	**DBH Standard Deviation**	**% Occupancy**	**Estimated Stems Per Hectare***
Cultural Woodlot - Feature S (2 Plots)					
Manitoba Maple	*Acer negundo*	17	5	59%	1700
White/Green Ash	*Fraxinus americana/pennsylvanica*	15	5	24%	700
Butternut	*Juglans cinerea*	19	7	10%	300
American Elm	*Ulmus americana*	10	0	7%	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.
*Note: Hedgerow tree density measured using 20 m x 2.5 m long transects, other areas measured using 5 m x 10 m plots.
**Exceptionally large tree specimens in the hedgerows were measured and are described in the text (above). However, they are not included here, as they disproportionately affect the average tree size.

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Photograph 20: Looking north at the northeast part of the Cultural Woodlot (Feature S). The existing farmhouse at 936 March Road is visible at the left (May 8th, 2018).

Photograph 21: Looking west at the southwest part of the Cultural Woodlot (Feature S) (May 8th, 2018).

Woodlot S-20 and Surrounding Recent Regrowth

Woodlot S-20 refers to the forested area west of the Former CN Railway Corridor. Approximately half of Woodlot S-20 is found within the Study Area, with the remainder of the feature occurring within the adjacent KNUEA Northeast Quadrant. Within the Study Area, Woodlot S-20 and the surrounding recent regrowth communities are divided into four (4) distinct ecological communities. These communities differ in terms of their species composition and age. Tree size measurements and plant lists provided by MEP (2016) have been integrated below, along with the results of MES's 2018 surveying. These vegetation communities include the following:

- **Fresh-Moist Ash – Poplar Deciduous Forest (Feature T):** The Fresh-Moist Ash-Poplar Deciduous Forest (Feature T) is present around the southern edge of Woodlot S-20. This community consists primarily of young recent regrowth White/Green Ash, Trembling Aspen and American Elm that vary in size between approximately 10 cm to 30 cm dbh. Manitoba Maple and Butternut are also present. As noted above in Section 3.2, historic air photos suggest that the majority of tree cover within this area is approximately 10 to 20 years old. Shrub cover is generally dense and includes Hawthorn, Wild Red Raspberry, Red Elderberry, Prickly Gooseberry, Riverbank Grape, Glossy Buckthorn, Tartarian Honeysuckle, Prickly Ash, and Red Osier Dogwood. Much of the groundcover is reflective of disturbed conditions with Blue Grass, Reed Canary Grass, Brome Grass, Virginia Creeper, Common Burdock, Tufted Vetch, Canada Thistle, Elecampane, Canada Goldenrod, Wild Parsnip, Sensitive Fern, Canada Anemone, New England Aster, Riverbank Grape, Common Stinging Nettle, Bull Thistle, Canada Thistle, Field Horsetail, Poison Ivy, Dandelion, and White Avens present.
- **Fresh-Moist White Cedar Coniferous Forest / White Cedar Coniferous Swamp (Feature U):** Feature U is a mature forest that is dominated by White Cedar, with White/Green Ash and American Elm well represented. Smaller numbers of Large Tooth Aspen, Black Cherry, Trembling Aspen, Bur Oak, White Birch, and Butternut are also present, especially around the edges of the feature. The moisture regime varies between fresh-moist and coniferous swamp conditions. The majority of White Cedar stems are relatively small (10 cm to 20 cm dbh), however, older White Cedar specimens are present within the western part of the feature. As described above in Section 3.2, the western part of Feature U represents the oldest part of Woodlot S-20, with the oldest trees exceeding approximately 40 years of age. MEP (2016) completed an inventory of large trees within Woodlot S-20 (see below), during which several dozen White Cedars in the range of 40 cm dbh to 71 cm dbh were identified (MEP 2016). Several larger Trembling Aspen, White Ash, and Butternuts were also identified (MEP 2016). Although several large trees are present, they represent the minority of stems. The measurements included below in Table E reflect the average tree sizes, which are much smaller than the largest specimens. Shrub cover is generally sparse but includes Hawthorn, Wild Red Raspberry, Red Elderberry, Prickly Gooseberry,

Glossy Buckthorn, Tartarian Honeysuckle, Prickly Ash, and Red Osier Dogwood. Much of the groundcover is reflective of disturbed conditions with Blue Grass, Brome Grass, Virginia Creeper, Common Burdock, Riverbank Grape, Hog Peanut, Common Stinging Nettle, Bull Thistle, Canada Thistle, Field Horsetail, Poison Ivy, Common Mugwort, Wild Cucumber, Yellow Sorrel, Tall Buttercup, Dandelion and Tufted Vetch present. Wild Sarsaparilla, White Snakeroot, Jack in the Pulpit, Lady Fern, and White Trillium were also noted, particularly in areas with thick canopy cover. In wetter areas, Purple Loosestrife, Spotted Touch Me Not, Ostrich Fern, and Common Cattail were present.

- **Cultural Thicket (Feature V):** The Cultural Thicket (Feature V) represents an area that was cleared within the last ten (10) years, and hence is in an early regrowth condition. The Cultural Thicket is dominated by young Trembling Aspen and White/Green Ash saplings, with dense Slender Willow shrubs, Common Buckthorn, and Prickly Ash. Much of the groundcover is reflective of disturbed conditions with Blue Grass, Brome Grass, Reed Canary Grass, Virginia Creeper, Common Burdock, Canada Goldenrod, Canada Anemone, New England Aster, Riverbank Grape, Common Stinging Nettle, Bull Thistle, Canada Thistle, Field Horsetail, Poison Ivy, Dandelion, and White Avens present. Purple Loosestrife, Common Cattail, and Spotted Touch Me Not are present in wetter areas.
- **Fresh-Moist Poplar Deciduous Forest (Feature W):** The Fresh-Moist Poplar Deciduous Forest (Feature W) is dominated by Trembling Aspen that vary in size between approximately 10 cm to 25 cm dbh. American Elm, White/Green Ash, White Cedar and White Pine are also present. As noted above in Section 3.2, historic air photos suggest that the majority of tree cover within this area is approximately 10 to 20 years old. Red Osier Dogwood, Prickly Ash, Wild Red Raspberry, Slender Willow and Common Buckthorn shrubs are common. The understory reflects the disturbed conditions and includes Meadow Grass, Tall Buttercup, Canada Goldenrod, Red and White Clover, Common Strawberry, Poison Ivy, Tufted Vetch, White Avens, Yellow Violet, Daisy Fleabane, New England Aster, and Common Dandelion. It should be noted that a small portion of the Fresh-Moist Poplar Deciduous Forest (Feature W) is also found east of the Former CN Railway Corridor.

WOODLOT S-20 LARGE TREE INVENTORY

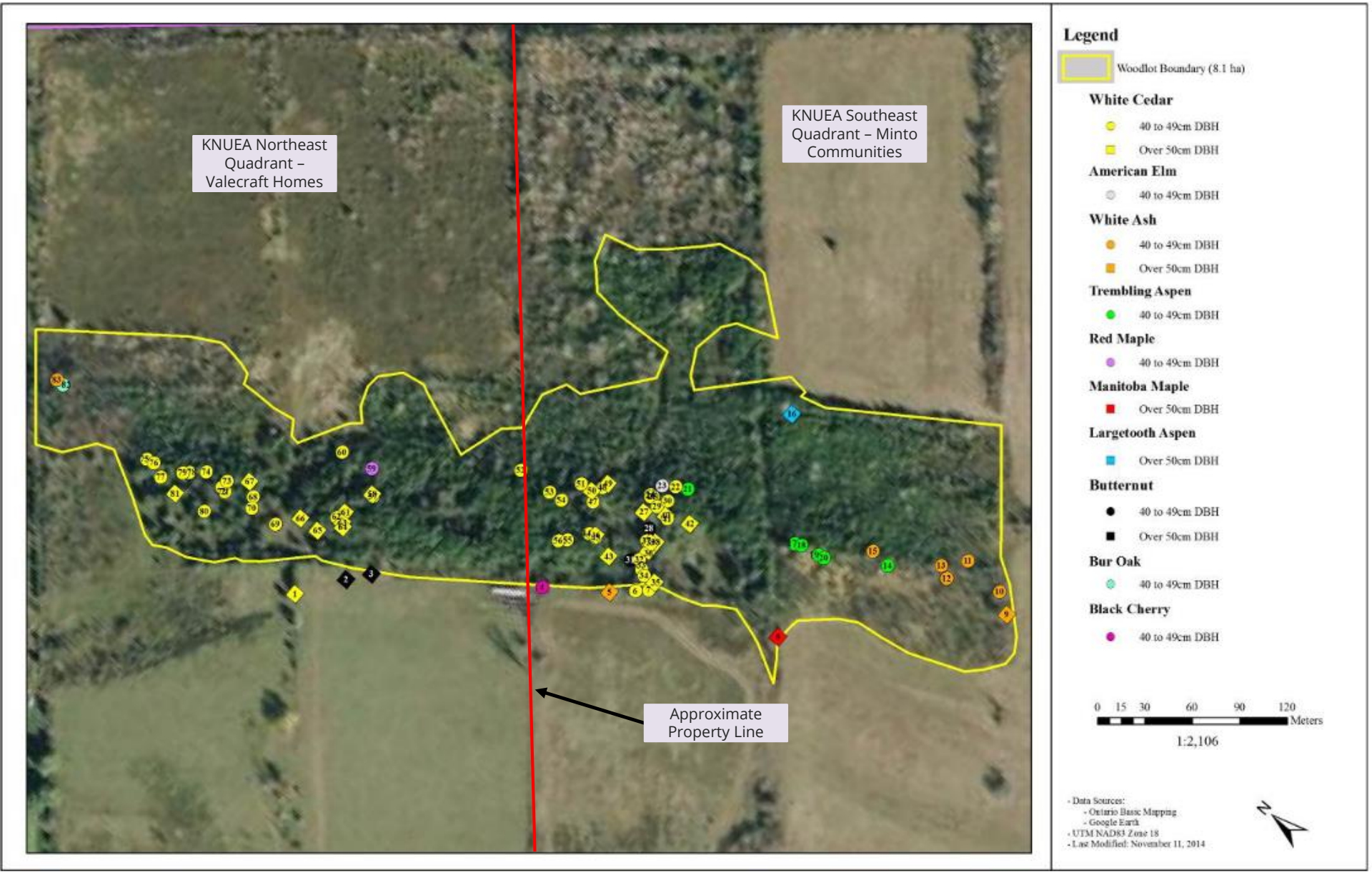

Figure taken from Muncaster Environmental Planning (2016)

Table E: Woodlot S-20 and Surrounding Recent Regrowth

Common Name	Scientific Name	Average DBH	DBH Standard Deviation	% Occupancy	Estimated Stems Per Hectare*
Fresh-Moist Ash - Poplar Deciduous Forest - Feature T (2 Plots)					
White/Green Ash	*Fraxinus americana/pennsylvanica*	13	3	44%	800
Trembling Aspen	*Populus tremuloides*	21	8	33%	600
American Elm	*Ulmus americana*	17	5	22%	400
Fresh-Moist White Cedar Coniferous Forest / White Cedar Coniferous Swamp - Feature U (4 Plots)					
White Cedar	*Thuja occidentalis*	13	3	97%	3400
American Elm	*Ulmus americana*	14	N/A	1%	50
White/Green Ash	*Fraxinus americana/pennsylvanica*	10	N/A	1%	50
Fresh-Moist Poplar Deciduous Forest - Feature W (2 Plots)					
Trembling Aspen	*Populus tremuloides*	17	4	83%	1500
White Cedar	*Thuja occidentalis*	11	1	11%	200
White Pine	*Pinus strobus*	35	N/A	6%	100

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.

*Note: Hedgerow tree density measured using 20 m x 2.5 m long transects, other areas measured using 5 m x 10 m plots.

**Exceptionally large tree specimens in the hedgerows were measured and are described in the text (above). However, they are not included here, as they disproportionately affect the average tree size.

Photograph 22: Looking east at the Fresh-Moist Ash – Poplar Deciduous Forest (Feature T) (June 21st, 2018).

Photograph 23: Interior of the Fresh-Moist Ash – Poplar Deciduous Forest (Feature T) (May 8th, 2018).

Photograph 24: Interior of the Fresh-Moist White Cedar Coniferous Forest / White Cedar Coniferous Swamp (Feature U) (May 8th, 2018).

Photograph 25: Interior of the Cultural Thicket (Feature V) (May 8th, 2018).

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Photograph 26: Looking west at the Fresh-Moist Poplar Deciduous Forest (Feature W) from the Former CN Railway Corridor (May 8th, 2018).

Photograph 27: Looking north at the Fresh-Moist Poplar Deciduous Forest (Feature W) from the Cultivated Field (June 8th, 2018).

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Woodlot S-23 and Surrounding Recent Regrowth

Woodlot S-23 refers to the forested area east of the Former CN Railway Corridor. Approximately half of Woodlot S-23 is found within the Study Area, with the remainder of the feature occurring within the adjacent KNUEA Northeast Quadrant. Within the Study Area, Woodlot S-23 and the surrounding recent regrowth communities are divided into four (4) distinct ecological communities. These communities differ in terms of their species composition and age. The Fresh-Moist Poplar Deciduous Forest (Feature W) is similar to the forest community found west of the Former CN Railway Corridor (described above). Tree size measurements and plant lists provided by MEP (2016) have been integrated below, along with the results of MES's 2018 surveying. The four (4) vegetation communities include the following:

- **Fresh-Moist Poplar Deciduous Forest (Feature W):** Feature W is described above under the previous heading.
- **Fresh-Moist White Cedar Hardwood Mixed Forest (Feature X):** The Fresh-Moist White Cedar Hardwood Mixed Forest (Feature X) is dominated by White Cedar, with White/Green Ash, Sugar Maple, Butternut and Black Cherry well represented. White Birch, American Elm, Red Maple, Basswood, and Bur Oak are also present. Average White Cedar tree sizes vary from approximately 20 cm to 40 cm dbh, whereas the average White/Green Ash tree sizes vary between approximately 30 cm and 50 cm dbh. Several large Butternut Trees are present, as are mature White Pine, Sugar Maple, and Bur Oak specimens. As noted above in Section 3.2, historic air photos suggest that Feature X and Feature Y (the western part of Woodlot S-23) is likely to be over 40 years old (approximately). The shrub cover is relatively sparse and includes Nannyberry, Tartarian Honeysuckle, Prickly Ash, Domestic Apple, and Wild Red Raspberry. The groundcover includes Ostrich Fern, White Snakeroot, Lady Fern, White Trillium, Poison Ivy, Virginia Creeper, Yellow Avens, Common Strawberry, Yellow Violet, Wild Cucumber, Bittersweet Nightshade, Jack in the Pulpit, and Common Stinging Nettle.
- **Dry-Fresh Sugar Maple – Ash Deciduous Forest (Feature Y):** The Dry-Fresh Sugar Maple – Ash Deciduous Forest (Feature Y) is dominated by Sugar Maple and White/Green Ash, with Basswood and Butternut well represented. American Elm, White Birch and Bur Oak are also present, as are isolated Red Maple, Manitoba Maple, Trembling Aspen, White Pine, White Cedar, and Yellow Birch. The average tree sizes are in the range of approximately 20 cm to 40 cm dbh. However, several large trees are present, including large Butternuts, a 111 cm Sugar Maple, White Pine up to 90 cm dbh, and Bur Oak up to 100 cm dbh. Shrub cover includes Nannyberry, Wild Red Raspberry, Prickly Ash, Glossy Buckthorn, Common Buckthorn, Tartarian Honeysuckle, Prickly Gooseberry, and Red Elderberry. Sensitive Fern and Ostrich Fern are common groundcover in some areas. Throughout the majority of the feature groundcover includes Canada Goldenrod,

White Snakeroot, Philadelphia Fleabane, Wild Ginger, White Avens, Yellow Violet, Virginia Creeper, White Trillium, Jack in the Pulpit, Poison Ivy, White Avens, and Common Stinging Nettle.

- **Cultural Thicket (Feature Z):** The Cultural Thicket (Feature Z) is a recent regrowth area that is shown in historic air photos to have little tree cover as recently as 2005 (Refer to Section 3.2). Tree cover is dominated by young American Elm and White/Green Ash between approximately 10 cm and 25 cm dbh. Bur Oak and Manitoba Maple are also present. Tree cover is discontinuous, with many open areas and shrub stands. Shrub cover includes Hawthorn, Domestic Apple, Prickly Ash, Common Buckthorn, Choke Cherry, and Tartarian Honeysuckle. Groundcover includes many species that reflect the open/disturbed conditions including Meadow Grass, Blue Grass, Orchard Grass, Brome Grass, Yellow Hawkweed, Canada Anemone, Timothy, White Bedstraw, Bird's Foot Trefoil, Goat's Beard, Queen Anne's Lace, Common Mullein, Common Milkweed, Bull Thistle, Ox-eye Daisy, Common Strawberry, White Avens, Common Buttercup, Self-Heal, Tufted Vetch, New England Aster, Bladder Campion, Common Burdock, Virginia Creeper, Canada Goldenrod, Common Ragweed, Wild Parsnip, Philadelphia Fleabane, Sow Thistle, Yellow Rocket, Elecampane, Common Plantain, Red and White Clover, and Dandelion.

Table F: Woodlot S-23 and Surrounding Recent Regrowth

Common Name	Scientific Name	Average DBH	DBH Standard Deviation	% Occupancy	Estimated Stems Per Hectare*
Fresh-Moist Poplar Deciduous Forest - Feature W (2 Plots)					
Refer to Table E for Feature W Inventory					
Fresh-Moist White Cedar Hardwood Mixed Forest - Feature X (1 Plot)					
White Cedar	*Thuja occidentalis*	29	8	55%	1200
White/Green Ash	*Fraxinus americana/pennsylvanica*	41	10	18%	400
Butternut	*Juglans cinerea*	67	N/A	9%	200
Black Cherry	*Prunus serotina*	10	N/A	9%	200
Sugar Maple	*Acer saccharum*	12	N/A	9%	200
Dry-Fresh Sugar Maple - Ash Deciduous Forest - Feature Y (3 Plots)					
Sugar Maple	*Acer saccharum*	18	7	36%	670
White/Green Ash	*Fraxinus americana/pennsylvanica*	30	9	36%	670
Basswood	*Tilia americana*	20	12	11%	201
Butternut	*Juglans cinerea*	27	20	7%	134
American Elm	*Ulmus americana*	18	N/A	4%	67
Bur Oak	*Quercus macrocarpa*	34	N/A	4%	67
White Birch	*Betula papyrifera*	34	N/A	4%	67
Cultural Thicket - Feature Z (2 Plots)					
American Elm	*Ulmus americana*	17	4	54%	700
White/Green Ash	*Fraxinus americana/pennsylvanica*	16	7	38%	500
Bur Oak	*Quercus macrocarpa*	23	N/A	8%	100

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.

*Note: Hedgerow tree density measured using 20 m x 2.5 m long transects, other areas measured using 5 m x 10 m plots.

**Exceptionally large tree specimens in the hedgerows were measured and are described in the text (above). However, they are not included here, as they disproportionately affect the average tree size.

Photograph 28: Interior of the Fresh-Moist White Cedar – Hardwood Mixed Forest (Feature X) (May 8th, 2018).

Photograph 29: Interior of the Dry-Fresh Sugar Maple – Ash Deciduous Forest (Feature Y) (May 8th, 2018).

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Photograph 30: Looking north at the Dry-Fresh Sugar Maple – Ash Deciduous Forest (Feature Y) (June 8th, 2018).

Photograph 31: Interior of the Cultural Thicket (Feature Z) (May 8th, 2018).

3.3.3 Woodlot S-20 - Significant Woodlot Assessment (TCR)

Woodlot S-20 and the surrounding areas of recent regrowth stretch between both the KNUEA Northeast Quadrant (the adjacent property) and the KNUEA Southeast Quadrant (the current Study Area). The KNUEA Environmental Management Plan (EMP) identified a portion of Woodlot S-20 to be retained within the adjacent KNUEA Northeast Quadrant, however, the feature was not identified for retention within the current Study Area (Novatech 2016b). MEP (2016) evaluated Woodlot S-20 and concluded that while several mature trees are present within the feature, overall the feature does not have the attributes to be considered a Significant Woodlot. This is consistent with the City of Ottawa's evaluation, as Woodlot S-20 is not shown as a natural heritage feature within the City of Ottawa's Natural Heritage System Overlay (City of Ottawa 2014). The following is a summary of the Significant Woodlot criteria for Woodlot S-20 (OMNRF 2010):

- **Woodland Size Criteria** – The Study Area is within the MVCA's Ottawa River Tributaries Subwatershed, which has approximately 37.2% forest cover (MVCA 2013). In planning areas with 30-60% forest cover, woodlots 60 ha or larger would qualify under the size criteria. Some of the recent regrowth habitats found around Woodlot S-20 should not be considered part of the woodlot. However, even if all connected trees and thicket habitats were counted together (which overestimates the feature's size), Woodlot S-20 and the surrounding recent regrowth are only approximately 15 ha in size (with the forested habitats being smaller than this). Woodlot S-20 is hence too small to qualify under the 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. The western portion of Woodlot S-20 is only approximately 150 m wide, and hence all areas of the forest are within 100 m of an opening. Small areas of the eastern portion of the feature may be more than 100 m from an opening, however, these areas are negligible in size and the majority of the feature is within 100 m of an opening. As such, Woodlot S-20 does not provide significant interior forest habitat.
- **Proximity to Other Woodlands/Habitats** – Woodlots within 30 m of another significant feature meet this criteria. As discussed below, the only other significant features found within the Study Area are the North Tributary (more than 30 m away) and Woodlot S-23 (which is separated from Woodlot S-20 by the Former CN Railway Corridor). As such, Woodlot S-20 does not qualify under the proximity criteria.
- **Water Protection** – Several Ephemeral Farm Drainage Channels are found in the vicinity of Woodlot S-20. As discussed below, these features were evaluated and were determined to not provide significant ecological value (MEP 2015). The North Tributary is not found in close proximity to Woodlot S-20. Paterson Group (2013) investigated the infiltrative characteristics of Woodlot S-20 and concluded that the recharge potential of Woodlot S-20 is severely limited, and

from a hydrogeological perspective, is not considered to be unique in its contribution to groundwater recharge.

- **Linkages** – As discussed below, the North Tributary is likely to provide the major wildlife movement corridor through the Study Area, as many species will follow aquatic/riparian features across the landscape. Woodlot S-20 and the adjacent areas of recent regrowth are surrounded by agricultural fields on three (3) sides (north, west, south), and hence Woodlot S-20 is unlikely to provide a significant linkage function.
- **Woodlot Diversity** – As described above, the plant diversity within Woodlot S-20 is low, and the feature is dominated by White Cedar. Regrowth coniferous forests dominated by White Cedar are common throughout the region in degraded regenerating agricultural lands. Woodlot S-20 was 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 3.2, historic air photos indicate that the oldest trees within Woodlot S-20 are older than approximately 40 years. However, it is unlikely that any of the forested area is older than 100 years, and most of the tree cover is less than 40 years old. Woodlot S-20 is comprised of a common forest type that is abundant throughout the region in areas of degraded regenerating agricultural lands. As such, Woodlot S-20 does not qualify under the Uncommon Characteristics criteria.
- **Economic and Social** – Woodlots which contribute special economic or social functions can qualify under this criteria. Woodlot S-20 is located within a predominantly rural landscape, and there are relatively few residences within close proximity. No evidence of recreational usage has been noted. As such, Woodlot S-20 does not qualify under the Economic and Social criteria.

In summary, available evidence suggests that Woodlot S-20 does not qualify as a Significant Woodlot under any of the assessment criteria. This is consistent with the previous analysis completed by MEP (2016) and the City of Ottawa (2014).

3.3.4 Woodlot S-23 - Significant Woodlot Assessment (TCR)

Woodlot S-23 and the surrounding areas of recent regrowth stretch between both the KNUEA Northeast Quadrant (the adjacent property) and the KNUEA Southeast Quadrant (the current Study Area). MEP (2016) evaluated Woodlot S-23 and concluded that the feature may qualify as a Significant Woodlot due to the presence of mature trees, the presence of some interior forest habitat, and the presence of breeding Eastern Wood Pewee. As discussed below, Eastern Wood Pewee are a species of Special Concern, and breeding activity for the species results in the western part of Woodlot S-23 being identified as Significant Wildlife Habitat (OMNRF 2014b). Eastern Wood Pewee were again noted within Woodlot S-23 during the 2018 breeding bird survey (discussed below). Woodlot S-23 is shown as a natural heritage feature on the City of Ottawa's Natural Heritage System Overlay (City of Ottawa 2014). The following is a summary of the Significant Woodlot criteria for Woodlot S-23 (OMNRF 2010):

- **Woodland Size Criteria** – The Study Area is within the MVCA's Ottawa River Tributaries Subwatershed, which has approximately 37.2% forest cover (MVCA 2013). In planning areas with 30-60% forest cover, woodlots 60 ha or larger would qualify under the size criteria. Some of the recent regrowth habitats found around Woodlot S-23 should not be considered part of the woodlot. However, even if all connected trees and thicket habitats were counted together (which overestimates the feature's size), Woodlot S-23 and the surrounding recent regrowth are only approximately 13.5 ha in size (with the forested habitats being smaller than this). Woodlot S-23 is hence too small to qualify under the 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. The large opening contained within the northeastern part of Woodlot S-23 limits the potential for the feature to provide interior forest habitat. The western portion of Woodlot S-23 between the opening and the Former CN Railway Corridor is approximately 212 m wide. With openings on both sides, this leaves a relatively small area in the center of the feature that is more than 100 m from an opening. While interior forest habitat is present within the western part of Woodlot S-23, the interior forest habitat is relatively small.
- **Proximity to Other Woodlands/Habitats** – Woodlots within 30 m of another significant feature meet this criteria. As discussed below, the only other significant features found within the Study Area are the North Tributary (more than 30 m away) and Woodlot S-20 (which is separated from Woodlot S-23 by the Former CN Railway Corridor). As such, Woodlot S-23 does not qualify under the proximity criteria.
- **Water Protection** – An Ephemeral Farm Drainage Channel is found in the vicinity of Woodlot S-23. As discussed below, the Ephemeral Farm Drainage Channel was determined to not provide significant ecological value (MEP 2015). The North Tributary is not found in close proximity to

Woodlot S-23. As such, Woodlot S-23 does not appear to provide a significant water protection function.

- **Linkages** – As discussed below, the North Tributary is likely to provide the major wildlife movement corridor through the Study Area, as many species will follow aquatic/riparian features across the landscape. Woodlot S-23 and the adjacent areas of recent regrowth are surrounded by agricultural fields on two (2) sides (north, south), with March Valley Road and the Former CN Railway Corridor present on the remaining two (2) sides. While wildlife may be capable of traversing this area, Woodlot S-23 is unlikely to provide a significant linkage function.
- **Woodlot Diversity** – As described above, Woodlot S-23 was 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 3.2, historic air photos indicate that the oldest trees within Woodlot S-23 are older than approximately 40 years. A relatively high density of older trees is present within the western part of the feature. While it is unlikely that any of the forested area is older than 100 years, it is possible that the western part of the feature may exceed 60 years of age. Eastern Wood Pewee were documented within Woodlot S-23 by MEP (2016). Eastern Wood Pewee were again found calling within Woodlot S-23 during the 2018 breeding bird survey (discussed below). In both instances, Eastern Wood Pewee were documented within the western part of the feature. Due to the fact that Eastern Wood Pewee is a species of special concern, its presence results in the western portion of Woodlot S-23 being considered Significant Wildlife Habitat (OMNRF 2014b).
- **Economic and Social** – Woodlots which contribute special economic or social functions can qualify under this criteria. Woodlot S-23 is located within a predominantly rural landscape, and there are relatively few residences within close proximity. No evidence of recreational usage has been noted. As such, Woodlot S-23 does not qualify under the Economic and Social criteria.

In summary, available evidence suggests that Woodlot S-23 may qualify as a Significant Woodlot due to the presence of a comparatively high density of older trees, the presence of interior forest habitat, and the presence of Significant Wildlife Habitat (due to breeding Eastern Wood Pewee). This is consistent with the previous analysis completed by MEP (2016) and the City of Ottawa (2014). The KNUEA Environmental Management Plan (EMP) identified the western portion of Woodlot S-23 for retention within both the Northeast Quadrant and the current Study Area (Novatech 2016b). Within the Minto Site, Block 525 includes the approximately 2.4 ha retained portion of Woodlot S-23. A similar sized block should be preserved within the adjacent KNUEA Northeast Quadrant. However, it should be noted that the precise limits of the retained area of Woodlot S-23 will depend on the final detailed design of the SWM Pond, and hence may change as a result of detailed design. As described

above in Section 2.0.1, a large tree inventory was undertaken in June 2019. The large tree inventory identifies the location, condition, and species of trees ≥50 cm dbh in size within Woodlot S-23. The large tree inventory will help guide the detailed design process for the SWM Pond. The large tree inventory has been submitted to the City of Ottawa under separate cover. It is anticipated that the core of Woodlot S-23 will ultimately be retained. The inlet channels to the new SWM Pond will consist of buried pipes, which will be placed outside the limits of the retained portion of Woodlot S-23. Per the tree preservation mitigation measures described in Section 4.1.2, where feasible, the inlet pipes should be placed beyond the critical root zone of any boundary trees that occur along the edges of the retained portion of Woodlot S-23. This will ensure that the installation of the inlet pipes does not negatively impact the retained portion of Woodlot S-23.

The majority of older trees, the interior forest habitat, and occurrences of Eastern Wood Pewee were all present primarily in the western part of Woodlot S-23. In contrast, the eastern portion of the feature is fragmented by additional openings, tree cover is younger, and occurrences of Eastern Pewee were not documented. As such, the preservation of the western portion of Woodlot S-23 is anticipated to be sufficient to preserve the woodlot's significant features and functions.

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3.3.5 Open Habitats

The majority of the Study Area is dominated by open habitats including Cultivated Fields planted with soybeans. Several of the fields were observed to be recently Fallow Fields (Graminoid Meadow) in 2018. Farming within the Study Area is continuously rotated between the fields, such that a portion of the agricultural fields are fallow at any given time. The extent of cultivation within the Study Area is shown in Figure 3 based on surveying observations completed in the summer of 2018. Open habitats are described below:

- **Cultivated Fields:** Areas under cultivation in 2018 are shown in Figure 3. Fields were observed to be newly tilled and/or bare in the spring and planted with soybeans in the summer.
- **Fallow Fields (Graminoid Meadow):** Three (3) small patches of fallow regenerating agricultural fields (Graminoid Meadow) are present in the central part of the Study Area. Two (2) larger fallow fields are also present in the southeast part of the Study Area (immediately west of the Former CN Railway Corridor). The fallow fields are dominated by Reed Canary Grass, Meadow Grass, Blue Grass, Orchard Grass and Brome Grass. Various sedges are also represented in the fallow fields in the southeast part of the Study Area (immediately west of the former CN Railway Corridor). Herbaceous and forb plants include Yellow Hawkweed, Canada Anemone, Timothy, White Bedstraw, Bird's Foot Trefoil, Goat's Beard, Queen Anne's Lace, Common Mullein, Common Milkweed, Bull Thistle, Ox-eye Daisy, Common Strawberry, White Avens, Common Buttercup, Self-Heal, Tufted Vetch, New England Aster, Bladder Campion, Common Burdock, Virginia Creeper, Black Medic, Black Eyed Susan, Canada Goldenrod, Common Ragweed, Wild Parsnip, Philadelphia Fleabane, Baby's Breath, Sow Thistle, Yellow Rocket, Elecampane, Common Plantain, Red and White Clover, and Dandelion. Due to recent cultivation, the fallow fields predominantly lack tree and shrub cover.

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FIGURE 3: OPEN HABITATS

Minto Communities & 2559688 Ontario Inc.
Kanata North Development (936 March Road) - Combined EIS & TCR (Revised)

Please Note: This is not a legal land survey. All dimensions and locations are shown as approximate. Fields that are shown as Cultivated or Fallow are based on observations in June 2018. Cultivation is continuously rotated, and hence varies year to year.

Photograph 32: A recently Fallow Agricultural Field (Graminoid Meadow) in the southeastern part of the Study Area, immediately west of the Former CN Railway Corridor (June 21st, 2018).

Photograph 33: A Cultivated Agricultural Field in the northwestern part of the Study Area (May 29th, 2018).

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Photograph 34: A recently planted Cultivated Agricultural Field east of the Former CN Railway Corridor (June 8th, 2018).

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3.4 Watercourses and Fish Habitat

3.4.1 Tributaries of Shirley's Brook

The North Tributary (Tributary #2) originates west of March Road in the Northwest Quadrant of the KNUEA. After crossing March Road, the North Tributary flows parallel to the northern boundary of the Commercial Blocks (in the northwest corner of the Study Area), before turning south and flowing in an approximately north to south direction through the Study Area. The North Branch (Tributary #3) of Shirley's Brook originates west of March Road in the Southwest Quadrant of the KNUEA. After crossing March Road, the North Branch flows through the adjacent 910 March Road property, and is aligned approximately parallel to the southern boundary of the Commercial Blocks (in the southwest corner of the Study Area). The North Tributary and the North Branch converge immediately south of the Study Area. The tributaries are shown below in Figure 4.

The KNUEA Environmental Management Plan (EMP) establishes a minimum 40 m wide corridor of retained and/or enhanced habitat around the tributaries of Shirley's Brook. Within the Minto Site, this corridor is provided by several connected open space blocks that separate the Commercial Blocks (owned by 2559688 Ontario Inc.) from the Minto Communities development. The open space blocks proposed within the Minto Site provide the 40 m wide watercourse corridor for the north-south aligned portion of the North Tributary. The future detailed Site Plan for the Commercial Blocks will be required to identify open space blocks to protect the west-east portions of the North Tributary and the North Branch, which run parallel to the northern and southern boundaries of the Commercial Blocks (respectively).

As discussed below, it is anticipated that habitat enhancement features will be required within the 40 m wide watercourse corridor adjacent to the existing channel, in order to improve the quality of the aquatic habitat and riparian areas for Blanding's Turtles, fish, amphibians, and other wildlife. Due to the fact that the North Tributary is not proposed to be realigned and/or significantly altered as part of the undertaking, a full Headwaters Drainage Assessment (HDA) was not required to support the development of the Minto Site and the Commercial Blocks.

As discussed above in Section 3.3, a corridor of Riparian Vegetation (Feature R) exists surrounding the North Tributary. Tree cover is dominated by White/Green Ash and Manitoba Maples. However, several large Crack Willows are present, most of which are 60 cm to 80 cm dbh in size, although some specimens up to 150 cm dbh are also present. The Crack Willows are not native species, and were likely planted as landscaping features along the creek. Shrub cover includes Wild Red Raspberry, Common Buckthorn and Tartarian Honeysuckle. Groundcover is dominated by Reed Canary Grass with Purple Loosestrife, Spotted Touch Me Not, and Common Cattail present.

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Throughout the Study Area, the majority of the North Tributary banks include tree and/or shrub cover, although woody vegetation is sparse in some sections, with open patches occurring in some areas.

Upstream connection and the bulk of water flow is contributed from the upstream areas of the North Tributary. While overland flow from within the Study Area likely contributes to the North Tributary hydrology, overall the bulk of water flow originates from upstream areas. There are currently two (2) constrictions along the North Tributary within the Study Area. A 900 mm CSP culvert was installed historically by the farmer to control water levels from a beaver dam. As discussed in Section 4.2.2, the 900 mm CSP culvert will be removed during development of the Minto Site. The only water crossing that currently exists within the Study Area is the driveway to the farmhouse at 936 March Road, which crosses the North Tributary. The driveway includes a 1500 mm CSP culvert which is approximately 6.5 m long. The driveway/1500 mm CSP culvert cannot be removed, as the farmhouse will be retained and is within a separate block of land which is not part of the current development. The existing 1500 mm CSP culvert is large enough to allow the passage of Blanding's Turtles, fish, and other wildlife.

Spring water depths are in the range of approximately 20 cm to 50 cm, with water depths and flow velocity declining rapidly in late spring and early summer. By mid-summer, the North Tributary typically remains hydrated, although water depths are typically less than 10 cm in run sections and less than 20 cm in pools. Bankfull widths range between approximately 3 m to 5 m. The channel is generally dominated by silt/muddy bottom in the northern part of the Study Area, transitioning to sand and bedrock interspersed with clay, cobble and gravel in the southern part of the Study Area. Due to the shade created by the adjacent riparian vegetation, in-stream cover is generally limited. In some areas this includes patches of Reed Canary Grass, Purple Loosestrife, Common Cattail, and Spotted Touch Me Not. However, the majority of the North Tributary channel within the Study Area remains open during the growing season.

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FIGURE 4: AQUATIC HABITATS

Minto Communities & 2559688 Ontario Inc.
Kanata North Development (936 March Road) - Combined EIS & TCR (Revised)

- Study Area

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

Photograph 35: Looking south at the North Tributary, south of the driveway to the farmhouse at 936 March Road (May 8th, 2018).

Photograph 36: Looking south at the North Tributary, north of the farmhouse at 936 March Road (May 8th, 2018).

Photograph 37: Looking east at the 900 mm CSP culvert that was historically installed to control water levels associated with a beaver dam. The 900 mm CSP culvert will be removed as part of the habitat enhancement works described in Section 4.2.2 (June 21st, 2018).

Photograph 38: Looking south at the North Tributary, near the northern edge of the Study Area (May 8th, 2018).

3.4.2 Ephemeral Farm Drainage Channels

A series of channels (referred to as Ephemeral Farm Drainage Channels) were dug historically within the eastern part of the Study Area in order to provide surface drainage of the agricultural fields. The Ephemeral Farm Drainage Channels were evaluated in detail through a Headwaters Drainage Assessment (HDA) completed by MEP (2015). The results of the MEP (2015) study are summarized here, however, additional detail is provided by the full report (included in Appendix C).

All of the Ephemeral Farm Drainage Channels are fed by surface drainage from the surrounding fields, and none of these features include direct upstream connection to any adjacent watercourses. The Ephemeral Farm Drainage Channels generally have a limited hydro-period that is confined to the early spring and/or immediately following storm events, during which the drains are fed by surface runoff from the surrounding fields (MEP 2015). As a result, the Ephemeral Farm Drainage Channels are dry for the majority of the growing season. In 2018, all of these features were observed to be completely surface dry by early June. The features are generally overgrown with terrestrial vegetation throughout the majority of the growing season. Terrestrial vegetation coverage varies, but is essentially the same as the adjacent terrestrial vegetation communities within which the Ephemeral Farm Drainage Channels occur (e.g. Deciduous Hedgerows, Forest, and/or Fallow Agricultural Fields). As discussed below, fish habitat functionality was found to be very limited. Due to their limited hydro-period and general lack of aquatic habitat, the Ephemeral Farm Drainage Channels were not shown to provide Category 2 Blanding's Turtle habitat (DST 2015). The KNUEA Community Design Plan (CDP) and Environmental Management Plan (EMP) did not recommend retention of any of the Ephemeral Farm Drainage Channels, unless those channels fall within other designated retained areas (e.g. the retained portion of Woodlot S-23) (Novatech 2016a; 2016b). Overall, the Ephemeral Farm Drainage Channels are not considered significant ecological features. Refer to MEP (2015) for a detailed discussion of management and mitigation recommendations for the Ephemeral Farm Drainage Channels. Mitigation measures to address the biological and hydrological functions of the Ephemeral Farm Drainage Channels are summarized in Sections 4.2.2 and 4.2.4.

MEP (2015) identified the presence of a small area of Ground Water Upwelling northwest of the portion of the Ephemeral Farm Drainage Channels which is aligned in a northwest to southeast direction within Woodlot S-20. MEP (2015) noted that the upwelling was present within ruts along an abandoned farm access road. The upwelling was observed to create a small pool and some flowing water, which travelled within the ruts of the abandoned farm access road to the adjacent Ephemeral Farm Drainage Channel (referred to as Side Branch 2 in MEP 2015). The adjacent Ephemeral Farm Drainage Channel (Side Branch 2) was observed by MEP to have standing water only (no flow) in 2014 and 2015. The feature was observed by MES to be completely surface dry in early June 2018.

These observations are consistent with those documented by Paterson Group (2015) as part of their *Shallow Bedrock Hydrogeological Assessment*. Paterson Group (2015) noted that at several locations, groundwater elevations were within the elevation of the overburden layers, or above ground surface. This suggests that the upper fractured bedrock layer is fully saturated, and that overburden soils are acting as a confining layer (Paterson Group 2015). The presence of overburden soils of lower hydraulic conductivity overlying the bedrock aquifer units limits the potential for significant groundwater discharge in these areas (Paterson Group 2015). Paterson Group (2015) concluded that the groundwater recharge and discharge is occurring on a localized scale within the shallow silty sand soils, while underlying clay soils and the limited extent of silty sand soils preclude any significant discharge or recharge from the underlying bedrock aquifer. Lastly, Paterson Group (2015) also noted that the adjacent Ephemeral Farm Drainage Channel (Side Branch 2) is negatively graded in areas, which allows water to pond and prevents water from flowing to adjacent areas. As such, the groundwater upwelling represents a negligible source of water contribution.

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Photograph 39: Ephemeral Farm Drainage Channel in the southeastern part of the Study Area, east of the Former CN Railway Corridor. Note the channel is entirely dry by late May (May 29th, 2018).

Photograph 40: Ephemeral Farm Drainage Channel in the south-central part of the Study Area, west of the Former CN Railway Corridor. Note limited area of stagnant standing water, with no flow (May 29th, 2018).

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Photograph 41: Ephemeral Farm Drainage Channel in the south-central part of the Study Area, west of the Former CN Railway Corridor. Note that the feature is entirely dry by mid-June (June 21st, 2018).

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3.4.3 Fish Habitat

In 2013, fish sampling was completed at five (5) locations along the North Tributary and the quality of aquatic habitat was described to support the KNUEA Environmental Management Plan (EMP) (MEP 2016). Fish sampling completed by MEP (2016) documented the presence of ten (10) species within the North Tributary including White Sucker, Central Mudminnow, Northern Redbelly Dace, Finescale Dace, Longnose Dace, Blacknose Dace, Fathead Minnow, Creek Chub, Brook Stickleback, and Pumpkinseed. Each of these are common species typically found in degraded systems and areas of low quality fish habitat. MEP (2016) concluded that the North Tributary appears to add to the overall productivity of the Shirley's Brook system, especially during the spring period. However, water depths are comparatively low and the North Tributary is prone to drying out. As such, fish communities may migrate downstream in the summer in some years. As noted above, the North Tributary will be preserved within the 40 m watercourse corridor, thereby maintaining the associated fish habitat.

No fish were documented throughout the majority of the Ephemeral Farm Drainage Channels (MEP 2015). MEP note that the only fish documented were occurrences of Brook Stickleback within a single refuge pool found within one of the Ephemeral Farm Drainage Channels in 2014. Brook Stickleback are exceedingly common and can tolerate highly degraded conditions. MEP (2015) concluded that the Brook Sticklebacks likely did not survive the summer of 2014, as the refuge pool was dry by mid-summer. The Ephemeral Farm Drainage Channels hence are likely to provide extremely limited functionality in terms of fish habitat, which is likely limited to the early spring in most years. Due to the lack of functionality, removal of the Ephemeral Farm Drainage Channels is unlikely to represent a significant negative impact in terms of the loss of fish habitat. Mitigation measures to address the biological and hydrological functions of the Ephemeral Farm Drainage Channels are summarized in Section 4.2.2 and 4.2.4.

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3.5 Adjacent Lands and Significant Features

March Road is located west of the Study Area, beyond which is the KNUEA Southwest Quadrant. The KNUEA Northeast Quadrant is located north of the Study Area. Both adjacent quadrants are scheduled for future subdivision development. A small portion of Woodlot S-20 is identified for retention within the KNUEA Northeast Quadrant. However, the retained area of Woodlot S-20 is separated from the Minto Site by proposed lots and a road, which are to be built in the adjacent quadrant. As such, development of the Minto Site will not occur directly adjacent to the portion of Woodlot S-20 that is identified for retention in the adjacent KNUEA quadrant. The portions of Woodlot S-23 that are to be retained within the Minto Site and within the Northeast Quadrant of the KNUEA will be adjacent to one another, and therefore development within the Minto Site is not anticipated to negatively impact the retained portion of Woodlot S-23 within the adjacent quadrant. March Valley Road is located to the east of the Minto Site, thereby providing separation between the Minto Site and the natural heritage features located to the east.

The KNUEA Environmental Management Plan (EMP) establishes a minimum 40 m wide corridor of retained and/or enhanced habitat around the tributaries of Shirley's Brook (Novatech 2016b). Within the Minto Site, this corridor is provided by several connected open space blocks that separate the Commercial Blocks (owned by 2559688 Ontario Inc.) from the Minto Communities development. The open space blocks proposed within the Minto Site provide the 40 m wide watercourse corridor for the north-south aligned portion of the North Tributary. The future detailed Site Plan for the Commercial Blocks will be required to identify open space blocks to protect the west-east portions of the North Tributary and the North Branch, which run parallel to the northern and southern boundaries of the Commercial Blocks (respectively).

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3.6 Wildlife and Significant Wildlife Habitat

Wildlife and bird species noted during surveys of the Study Area are listed in Appendix B. As discussed below in Section 3.7, the habitat of threatened Blanding's Turtle was confirmed within the Study Area. Eastern Wood Pewee (Special Concern) were also documented calling from the western part of Woodlot S-23, in the vicinity of Bird Survey Site #4. The habitat of Species at Risk (SAR) is considered Significant Wildlife Habitat (SWH) (Refer to Section 3.7). As discussed below, foraging Barn Swallows (threatened) were also observed, although no evidence of nesting within the Study Area was noted.

As noted above in Section 3.4, the North Tributary of Shirley's Brook (Referred to as Tributary #2 in the KNUEA Environmental Management Plan (EMP)) provides warm-water fish habitat. During the 2018 Whip Poor Will Call surveys, Grey Tree Frogs, Green Frogs, and Spring Peepers were documented calling in association with the North Tributary, which suggests that the watercourse also provides amphibian breeding habitat (Refer to Table G, below). Snapping Turtle (Special Concern) were also observed within the North Tributary (discussed below). The North Tributary is therefore considered Significant Wildlife Habitat. American Toad and Northern Leopard Frogs were also documented within the Study Area. Spring Peepers and American Toads were heard calling within the Ephemeral Farm Drainage Channels west of the Former CN Railway Corridor, however, calling densities were not sufficient for these features to be considered Significant Wildlife Habitat (MEP 2015).

Other than the features listed above, no stick nests, migratory bird stopover points, heron rookeries, caves, bedrock fissures, wetlands, or any other features which may qualify as SWH were noted within the Study Area (OMNRF 2014b).

Breeding bird survey points are shown below in Figure 5. A total of sixty nine (69) bird species were noted within the Study Area. This included several common species of migratory birds typically found in suburban and rural areas (including Barn Swallow and Eastern Wood Pewee, discussed below). Other wildlife observed within the Study Area included the amphibian species noted above, Eastern Grey Squirrel, Red Squirrel, Eastern Chipmunk, White Tailed Deer, Eastern Cottontail, North American Beaver, Common Raccoon, Groundhog, Coyote, Common Porcupine, and Garter Snake.

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FIGURE 5: BIRD SURVEY POINTS

Minto Communities & 2559688 Ontario Inc.
Kanata North Development (936 March Road) - Combined EIS & TCR (Revised)

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 Bobolink and Eastern Meadowlark

MEP (2016) documented the presence of Bobolink in several locations throughout the KNUEA, particularly west of March Road. During the 2018 breeding bird surveys, no evidence of Bobolink or Eastern Meadowlark nesting within the Study Area was noted. As described above, most of the open habitats within the Study Area were planted with soybeans in 2018. Fields planted with soybeans are generally not used by Bobolink or Eastern Meadowlark for nesting (SARO 2018). Within the Study Area, Fallow Agricultural Fields (Graminoid Meadow) occur in five (5) patches. However, only two (2) of the fallow fields are potentially large enough to attract Bobolink and Eastern Meadowlark nesting. Both patches are graminoid dominated and hence have the potential to providing breeding habitat for grassland birds (SARO 2018). However, no evidence of Bobolink or Eastern Meadowlark was noted. As such, Bobolink and Eastern Meadowlark are not a significant concern for the proposed development of the Minto Site and the Commercial Blocks.

3.7.2 Butternut Trees (TCR)

An updated Butternut Health Assessment (BHA) was completed for the entire Study Area in 2018 (Appendix D). A total of 127 Category 2 Butternut Trees and 22 Category 3 Butternut Trees were identified. Butternut Tree locations are shown in Figures 6 and 7. As shown below, the majority of Butternut Trees are clustered within either the Cultural Woodlot surrounding the farmhouse at 936 March Road or the western part of Woodlot S-23. However, additional Butternut Trees are scattered at various locations throughout the Study Area, including in Woodlot S-20 and in several hedgerows. Butternut Trees and their habitat are found within both the Minto Site and the Commercial Blocks. Potential impacts to Butternut Trees and regulatory requirements are discussed below in Section 4.4.1.

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FIGURE 6: BUTTERNUT LOCATIONS – SOUTHWEST

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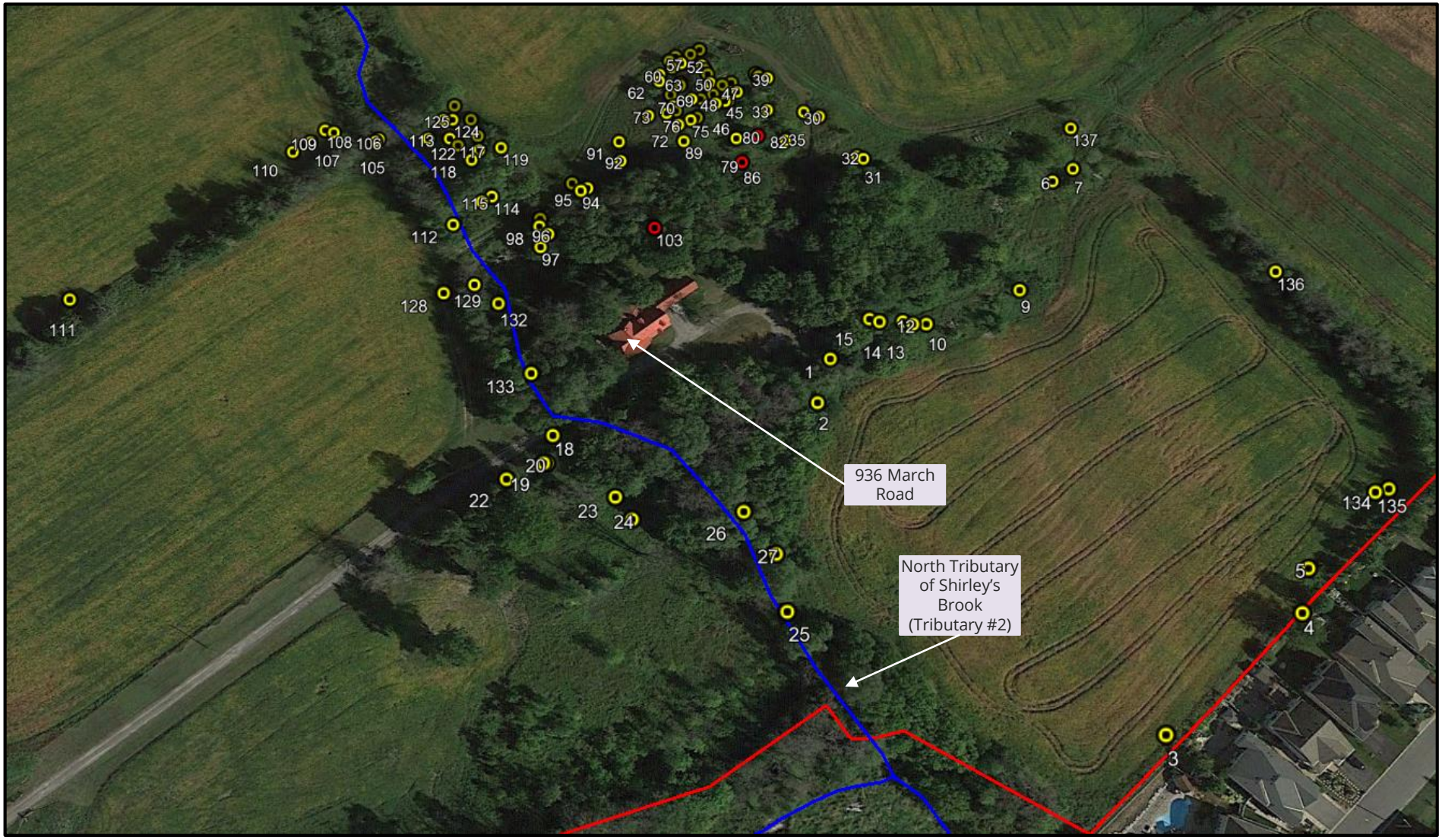
Kanata North Development (936 March Road) - Combined EIS & TCR (Revised)



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

- Study Area
- Category 2 Butternut
- Category 3 Butternut

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FIGURE 7: BUTTERNUT LOCATIONS – NORTHEAST

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Kanata North Development (936 March Road) - Combined EIS & TCR (Revised)

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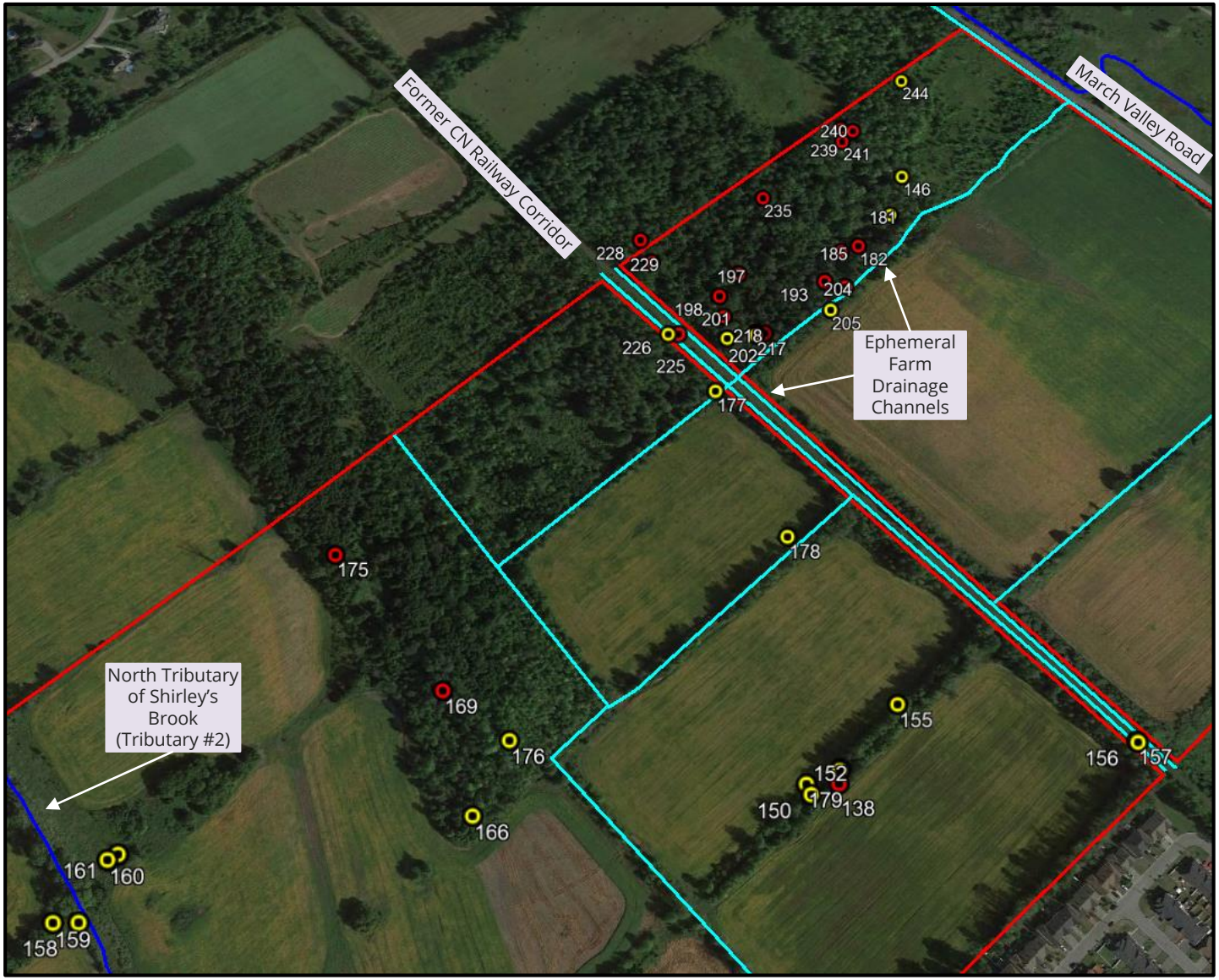


- Study Area
- Category 2 Butternut
- Category 3 Butternut

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

3.7.3 Blanding's Turtle

Detailed Blanding's Turtle surveying was completed in 2014 to support the KNUEA Environmental Management Plan (EMP) (MEP 2016). During the targeted turtle surveying, the only confirmed occurrence of Blanding's Turtle within the KNUEA was a single sighting of a turtle within the inline pond found west of 1035 March Road (within the Northwest Quadrant). More recently, in August 2017 a dead Blanding's Turtle (likely killed by road mortality) was found along March Road, adjacent to the entrance to the 936 March Road driveway. The August 2017 road mortality sighting was reported to the OMNRF. The turtle found adjacent to the 936 March Road driveway was found just north of the North Branch (Tributary #3) where the watercourse runs through the 910 March Road property. This suggests that Blanding's Turtle are continuing to utilize the tributaries of Shirley's Brook in the vicinity of the Study Area, as recently as 2017. The occurrence of confirmed Blanding's Turtle sightings within 2 km of the Study Area automatically designates suitable areas as habitat for the species (OMNRF 2014a). However, the fact that only two (2) individuals have been sighted in the area, despite extensive surveying over several years by several qualified biologists, suggests that the size of the Blanding's Turtle population is very small.

The results of the Blanding's Turtle surveying were reviewed in consultation with the OMNRF, and the extent of Blanding's Turtle habitat within the KNUEA was extensively studied. Consultation with the OMNRF culminated in acceptance of Blanding's Turtle habitat mapping which shows the extent of habitat throughout the KNUEA (DST 2015). There have been no significant changes to the Blanding's Turtle habitat since completion of the habitat mapping exercise, and therefore additional Blanding's Turtle surveys and habitat mapping is not required. For the purposes of this Combined Environmental Impact Statement (EIS) and Tree Conservation Report (TCR), as well as the future Overall Benefit Permit(s) application, the Blanding's Turtle habitat mapping that was previously reviewed and approved by the OMNRF will be utilized (DST 2015) (see below).

The General Habitat Description for Blanding's Turtle (OMNRF 2014a) recognizes three (3) types of habitat:

- **Category 1 Habitat:** Category 1 habitat includes areas where Blanding's Turtle overwinter and nesting areas. Blanding's Turtle typically overwinter in wetlands (as opposed to flowing watercourses) (OMNRF 2014a). The inline pond found west of 1035 March Road was identified by the OMNRF as a potential overwintering location, and was designated Category 1 habitat (within the KNUEA Northwest Quadrant). No Category 1 habitat was identified within the Study Area (DST 2015). There are no ponds within the Study Area which are large enough to have the potential to accommodate Blanding's Turtle overwintering. Nesting habitat includes areas of loose sandy fill or gravel where turtles can dig into the substrate to lay their eggs (OMNRF

2014a). There are no significant areas of natural exposed sand or gravel, and no artificial stockpiles within the Study Area. ***Under existing conditions, the total extent of Category 1 habitat shown within the Study Area is 0.00 ha (DST 2015).***

- **Category 2 Habitat:** Category 2 habitat includes wetlands and watercourses within 2 km of known Blanding's Turtle occurrences. Category 2 habitat includes the watercourse/wetlands themselves, as well as adjacent terrestrial areas up to 30 m from the water's edge (OMNRF 2014a). The main function of Category 2 habitat is to provide core foraging, basking and living areas that are utilized throughout the majority of the active season (OMNRF 2014a). As shown below, the tributaries of Shirley's Brook and the surrounding 30 m provides Category 2 habitat. In consultation with the OMNRF, it was determined that the Ephemeral Farm Drainage Channels do not qualify as Category 2 habitat (DST 2015). The majority of Category 2 habitat that is found within the Study Area is considered low quality habitat (DST 2015). ***The total amount of Category 2 habitat shown within the Study Area under existing conditions is 4.38 ha (DST 2015).***
- **Category 3 Habitat:** Category 3 habitat includes terrestrial areas extending up to 250 m from the edge of wetlands and watercourses (e.g. an additional 220 m from the edge of the Category 2 habitat, which includes a 30 m buffer from the high-water mark). The main function of Category 3 habitat is to provide corridors that allow Blanding's Turtles to move overland between adjacent Category 1 and 2 habitat features (OMNRF 2014a). Portions of the Study Area adjacent to the tributaries of Shirley's Brook are shown as Category 3 habitat. ***The total amount of Category 3 habitat shown within the Study Area under existing conditions is 34 ha (DST 2015).***

Potential impacts to Blanding's Turtle habitat and regulatory requirements are discussed below in Section 4.4.2.

425000 425500 426000 426500 427000 427500 428000

5024500 5024000 5023500 5023000

Quadrant B - Valecraft

Quadrant D - Metcalfe Realty Company Limited

Quadrant A - Junic/Multivesco

Quadrant C - Brigil

March Road

March Valley Road

Category 3 Habitat Removed by Stormwater Pond (Category 2 Habitat is Not Functional - Separated from Shirley's Brook by March Valley Road)

3.66 ha

7.51 ha

Category 3 Habitat Remains Undeveloped

13.85 ha

Category 3 Habitat - Residential Blocks

8.98 ha

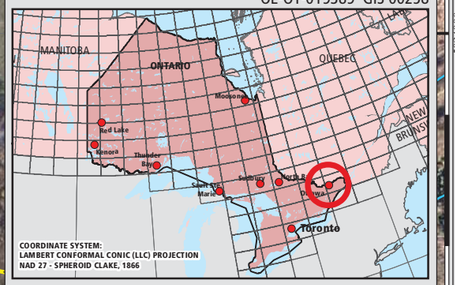
Category 3 Habitat - Commercial Blocks

Note:
1. Category 3 habitat not shown outside of study area.

Figure 3
Estimated Extent of Functional Habitat (Existing Conditions)

Kanata North Community Design Plan
Blanding's Turtle Habitat Compensation Plan
Ottawa, ON

OE-OT-019389 GIS 00258



COORDINATE SYSTEM:
LAMBERT CONFORMAL CONIC (LLC) PROJECTION
NAD 27 - SPHEROID CLAKE, 1866

- Blanding's Turtle
- Painted Turtle
- Turtle (Species Unconfirmed)
- Watercourse
- Waterbody
- Land Owner
- Category 1 Habitat
- Category 2 Habitat
- Category 3 Habitat

0 100 200 300 400 500
Meters

Coordinate System:
North American Datum (NAD) 1983
Universal Transverse Mercator (UTM) Zone 18N

DST consulting engineers

A:\GIS\OE-OT-019389 KANATA NORTH\MAP DOCUMENTS\20150206_FIGURE3_ESTIMATED EXTENT OF FUNCTIONAL HABITAT_UPDATE.MXD

3.7.4 Barn Swallow and Chimney Swift

MEP (2016) documented Barn Swallows foraging throughout the KNUEA, and nesting sites have been identified in several locations west of March Road. During the 2018 breeding bird survey, Barn Swallows were noted foraging during each survey visit, with Barn Swallows noted at Bird Survey Points #1, #4 and #9. No Chimney Swifts were noted during the Breeding Bird Surveys.

A total of seven (7) existing buildings are found within the Study Area, all of which are located within the parcel surrounding the farmhouse at 936 March Road. There are no buildings present within the Minto Site and the Commercial Blocks. Building locations are shown in Figure 8. These include the following:

- **Building #1:** Building #1 is the farmhouse at 936 March Road. The house consists of painted wood siding with a metal roof. The house is occupied and no significant exterior openings were noted. The farmhouse has a chimney with a metal cap.
- **Building #2:** Building #2 is a small wooden shed.
- **Building #3:** Building #3 is a medium sized wooden shed.
- **Building #4:** Building #4 is another medium sized wooden shed and glass gazebo.
- **Building #5:** Building #5 includes the foundation and walls of an older barn, however, no roof is present.
- **Building #6:** Building #6 is a collapsing wooden barn.
- **Building #7:** Building #7 is another small barn.

All exterior surfaces and all accessible interior surfaces of the buildings were inspected visually for the presence of Barn Swallow nests on May 8th, 2018. No evidence of Barn Swallow nesting was noted in any of the existing buildings, and no Barn Swallows were noted in the vicinity of the existing buildings during the Breeding Bird Survey. Although several of the buildings appear potentially suitable for Barn Swallow nesting, it should be noted that most of the buildings are shaded and/or overgrown by the Cultural Woodlot (Feature S). Barn Swallows generally nest in buildings that occur in open areas (SARO 2018). The only building that isn't surrounded by tree growth is the farmhouse (Building #1), and generally Barn Swallows are less likely to nest in occupied houses. The only chimney that is present within the Study Area is the chimney on the farmhouse (Building #1). However, the chimney has a metal cap.

No evidence of Barn Swallow and Chimney Swift nesting was noted within the Study Area, and therefore it is unlikely that either species will be a concern for the proposed development of the Minto Site and the Commercial Blocks. Although Barn Swallows have been noted foraging in the

Study Area, the development of the Minto Site and the Commercial Blocks is not anticipated to significantly impact the overall availability of foraging habitat.

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FIGURE 8: EXISTING BUILDINGS

Minto Communities & 2559688 Ontario Inc.
Kanata North Development (936 March Road) - Combined EIS & TCR (Revised)

7 - Existing Buildings

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

Photograph 42: Building #1 – Looking northwest at the farmhouse at 936 March Road (May 8th, 2018).

Photograph 43: The capped chimney on the farmhouse at 936 March Road (May 8th, 2018).

Photograph 44: Building #2 – Looking west at the small wooden shed (May 8th, 2018).

Photograph 45: Building #3 – Looking west at the medium wooden shed (May 8th, 2018).

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Photograph 46: Building #4 – Looking west at the small wooden shed and glass gazebo (May 8th, 2018).

Photograph 47: Building #5 – Looking south at the old barn foundation (May 8th, 2018).

Photograph 48: Building #6 – Looking west at the collapsing barn (May 8th, 2018).

Photograph 49: Building #7 – Looking southwest at the small barn (May 8th, 2018).

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3.7.5 Additional Species at Risk

The Natural History Information Center (NHIC) records for the nine (9) grids that include and surround the Study Area were reviewed. This included an area 3 km x 3 km in size and all published Species at Risk (SAR) records were noted. An updated Information and Records Request Response was also obtained from the OMNRF (Appendix E). In addition to Bobolink, Eastern Meadowlark, Butternut Trees, Blanding's Turtle, Barn Swallow, and Chimney Swift (discussed above), the following SAR were identified as potentially occurring within the vicinity:

- Bank Swallow - Threatened
- Little Brown Bat – Endangered
- Northern Long Eared Bat – Endangered
- Eastern Wood Pewee – Special Concern
- Wood Thrush – Special Concern
- Peregrine Falcon – Special Concern
- Canada Warbler – Special Concern
- Short Eared Owl – Special Concern
- Snapping Turtle – Special Concern
- Monarch – Special Concern
- Eastern Whip Poor Will – Threatened

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

- **Bank Swallow:** Bank Swallows nest in natural and artificial deposits of sand and silt with vertical faces (SARO 2018). There are no significant areas of exposed sand or silt within the Study Area and no stockpiles currently exist. No Bank Swallows were noted during the Breeding Bird Survey. As such, Bank Swallows are unlikely to be a significant concern for the proposed development of the Commercial Blocks and the Minto Site.
- **Little Brown Bat and 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 Study Area. 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. Furthermore, the OMNRF guidelines state that potential cavity/snag trees must be at least 25 cm dbh in size to potentially provide maternity roosting habitat. Vegetation communities are described above in Section 3.3. As described below, none of the forest communities within the Study Area were found to have sufficient densities of snag/cavity trees to potentially support maternity roosting habitat. As such, bat maternity roosting is unlikely to be a concern. The following is a summary

of the potential for the forest communities within the Study Area to provide maternity roosting habitat:

- **Fresh-Moist Poplar Deciduous Forest (Feature T):** Feature T consists of a relatively young recent regrowth habitat. As noted in Table E, most trees are less than 25 cm dbh, and the density of trees greater than this size is likely too low to support potential maternity roosting habitat.
- **Fresh-Moist White Cedar Coniferous Forest / White Cedar Coniferous Swamp (Feature U):** Feature U is a coniferous forest. The OMNRF guidelines state that only deciduous and mixed forest habitats have the potential to provide maternity roosting habitat (OMRNF 2011b).
- **Fresh-Moist Poplar Deciduous Forest (Feature W):** Feature W consists of a relatively young recent regrowth habitat. As noted in Table E, most trees are less than 25 cm dbh in size. A snag/cavity tree count was completed for Feature W, and only one (1) cavity tree was noted. The density of snag/cavity trees is hence too low to support potential maternity roosting habitat.
- **Fresh-Moist White Cedar – Hardwood Mixed Forest (Feature X):** As noted in Section 3.3, Feature X includes comparatively more mature trees than elsewhere within the Study Area. However, the mature trees are generally surrounded by younger stems that make up the majority of the forest cover, and hence the density of mature trees over 25 cm dbh remains inherently low. Within Feature X, over half the trees are White Cedar (55%) which are generally less suitable for maternity roosting. A snag/cavity tree count was completed for Feature X, and only one (1) cavity tree was noted. The density of snag/cavity trees is hence too low to support potential maternity roosting habitat.
- **Dry – Fresh Sugar Maple – Ash Deciduous Forest (Feature Y):** As noted in Section 3.3, Feature Y also includes comparatively more mature trees than elsewhere within the Study Area. However, the mature trees are generally surrounded by younger stems that make up the majority of the forest cover, and hence the density of mature trees over 25 cm dbh remains inherently low. A snag/cavity tree count was completed for Feature Y, and only two (2) cavity trees were noted. The density of snag/cavity trees is hence too low to support potential maternity roosting habitat.

Photograph 50: Example of a cavity tree (111 cm dbh Sugar Maple) – found within the Dry-Fresh Sugar Maple – White Ash Deciduous Forest (Feature Y). Note that the large tree is surrounded mostly by smaller stems, and hence the density of trees over 25 cm dbh is inherently low (May 8th, 2018).

- **Eastern Wood Pewee and Wood Thrush:** Eastern Wood Pewee and Wood Thrush both nest in mixed and deciduous forest (SARO 2018). Eastern Wood Pewee were documented in the western part of Woodlot S-23 by MEP (2016). During the 2018 Breeding Bird Surveys, Eastern Wood Pewee were again heard in the western part of Woodlot S-23 (in the vicinity of Bird Survey Site #4). Eastern Wood Pewee is a species of Special Concern. The presence of the species within the western part of Woodlot S-23 results in that portion of Woodlot S-23 being considered Significant Wildlife Habitat (OMNRF 2014b). As discussed below, the western portion of Woodlot S-23 has been identified for retention. No evidence of Wood Thrush was noted within the Study Area during the Breeding Bird Surveys. It should be noted that Eastern Wood Pewee are a species of special concern, and therefore their habitat is not protected under the Ontario Endangered Species Act. The wildlife and Species at Risk mitigation measures discussed below in Section 4.4.5 are designed to mitigate potential impacts to individual Eastern Wood Pewees at the construction stage.
- **Peregrine Falcon, Canada Warbler, Short Eared Owl:** Peregrine Falcon nest on top of large buildings in urban areas, and on cliffs in natural settings (SARO 2018). Peregrine Falcon forage in many habitats, including open areas, urban areas, and over water (SARO 2018). Short Eared Owls generally nest north of the Ottawa region, but may be found foraging in many open habitats (SARO 2018). Canada Warbler nest in deciduous forest, however, the species is very rare

in the Ottawa region (SARO 2018). None of these species were encountered during the Breeding Bird Surveys and it is considered relatively unlikely that significant habitat for these species is likely to occur within the Study Area. As such, Peregrine Falcon, Canada Warbler, and Short Eared Owl are not considered likely to be a significant concern for the development of the Commercial Blocks and the Minto Site.

- **Snapping Turtle:** A Snapping Turtle was observed within the North Tributary on June 21st, 2018. Snapping Turtles are found in many types of wetland and watercourse habitats, and hence they can be assumed to be present throughout the North Tributary (SARO 2018). As noted above, the North Tributary is considered Significant Wildlife Habitat due to the presence of Snapping Turtle, breeding amphibians, and fish. The North Tributary will be protected by the mitigation measures discussed below in Section 4.2. It should be noted that Snapping Turtles are a species of special concern, and therefore their habitat is not protected under the Ontario Endangered Species Act. The wildlife and Species at Risk mitigation measures discussed in Sections 4.4.5 and 4.4.6 are designed to mitigate potential impacts to individual Snapping Turtles at the construction stage.
- **Monarch Butterfly:** As described above in Section 3.3, Common Milkweed was noted within the Study Area in association with the Fallow Agricultural Fields (Graminoid Meadow). However, the density of Common Milkweed was not high, and no Monarch Butterflies were noted within the Study Area 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 Endangered Species Act. The wildlife and Species at Risk mitigation measures discussed in Section 4.4.5 will help to mitigate any potential impacts to individual Monarch Butterflies at the construction stage.
- **Eastern Whip Poor Will:** Whip Poor Will call surveys were completed throughout the KNUEA in 2014 to support the KNUEA Environmental Management Plan (EMP), and no evidence of Eastern Whip Poor Will was noted (MEP 2016). The *General Habitat Description for the Eastern Whip Poor Will* (OMNRF 2014c) 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). The Study Area generally does not provide the mosaic of half treed conditions preferred by Eastern Whip Poor Will. Updated Eastern Whip Poor Will surveying was completed in 2018, and no evidence of Eastern Whip Poor Will was noted. Eastern Whip Poor Will survey points are shown below in Figure 9. Survey conditions and results are summarized in Table G. Due to the lack of occurrences within the Study Area, Eastern Whip Poor Will are unlikely to be a significant concern for the development of the Commercial Blocks and the Minto Site.

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FIGURE 9: WPWI SURVEY POINTS

Minto Communities & 2559688 Ontario Inc.
Kanata North Development (936 March Road) - Combined EIS & TCR (Revised)

- Study Area
- Whip Poor Will Survey Points

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

TABLE G: WHIP POOR WILL SURVEY RESULTS						
Survey Date	**Temperature**	**Conditions**	**Wind Speed**	**Start Time**	**Whip Poor Will Calls**	**Other Species**
May 22nd, 2018	12ºC	Clear Skies	5 kph	9:50 PM	None	WPW 1 - Spring Peepers Heard in Tributary #2 WPW 2 - Same as WPW 1 WPW 3 - Spring Peepers Heard to East (Woodlot S-20) WPW 4 - None WPW 5 - Killdeer WPW 6 - Spring Peepers and American Toads Heard in Drainage Channels West of Railway Corridor WPW 7 - Same as WPW 6
May 29th, 2018	20ºC	Clear Skies	10 kph	9:20 PM	None	WPW 1 - Spring Peepers and Grey Treefrogs Heard in Tributary #2 WPW 2 - Same as WPW 1 WPW 3 - None WPW 4 - Killdeer and American Woodcock WPW 5 - American Woodcock WPW 6 - Spring Peepers and American Toads Heard in Drainage Channels West of Railway Corridor WPW 7 - Same as WPW 6
June 22nd, 2018	22ºC	60% Clear	5 kph	9:45 PM	None	WPW 1 - Green Frogs Heard in Tributary #2 WPW 2 - None WPW 3 - None WPW 4 - Killdeer WPW 5 - None WPW 6 - None WPW 7 - None

3.8 Linkages

Under existing conditions, March Road, March Valley Road, and the existing residential subdivision to the south of the Study Area represent barriers to wildlife movement. However, the predominantly agricultural nature of the Study Area likely allows wildlife to traverse the Study Area in multiple directions. In particular, species that are able to cross Cultivated Fields (e.g. White Tailed Deer, Coyote, Wild Turkeys, etc.) are more likely to utilize the Study Area as a movement corridor. However, less mobile species (including Blanding's Turtle) are likely to be more restricted in their movements within the Study Area, which are more likely to be concentrated around the North Tributary. Blanding's Turtles, as well as many other species, are more likely to follow the natural corridor created by the watercourse, as the North Tributary provides food, water, and shelter. By comparison, movement overland through the surrounding Cultivated Fields is less hospitable and more hazardous. Therefore, the North Tributary likely provides the primary linkage function within the Study Area for the majority of wildlife species.

Following the future development of the Commercial Blocks, the Minto Site, and the adjacent quadrants of the KNUEA, wildlife movement through the Study Area will be confined to the open space blocks that will provide the minimum 40 m wide corridor surrounding the tributaries of Shirley's Brook. The 40 m wide corridor was designed to provide a viable movement corridor, in order to maintain connectivity through the KNUEA lands.

4.0 DESCRIPTION OF ENVIRONMENTAL IMPACTS AND MITIGATION

4.1 Terrestrial Habitat and Tree Removal (TCR)

4.1.1 Tree Retention (TCR)

Tree cover within the Study Area is present within the vegetated Riparian Corridor (Feature R) surrounding the North Tributary, the Cultural Woodlot (Feature S) adjacent to the farmhouse at 936 March Road, within the various Coniferous and Deciduous Hedgerows (Features A to Q), within Woodlot S-20 and the surrounding areas of recent regrowth (Features T to W), and within Woodlot S-23 and the adjacent areas of recent regrowth (Features X to Z). Where trees overlap with areas identified for future development, trees generally cannot be preserved due to the density of proposed development, and the practical requirements for site servicing, grading, excavation, etc. However, as outlined below, trees may be retained within the open space blocks and at the development edges.

The KNUEA Environmental Management Plan (EMP) (Novatech 2016b) lists the following tree preservation recommendations (note that only recommendations which are relevant to the KNUEA Southeast Quadrant are listed here):

- *Where feasible, trees are to be retained within the 40 m wide corridors surrounding the tributaries of Shirley's Brook;*
- *Where feasible, the preservation of individual healthy trees and clusters of woody vegetation should be considered on a case-by-case basis along edge conditions, in neighborhood parks, and school sites*;
- *Where feasible, retain and/or enhance the existing perimeter hedgerows with active management and new native plantings to provide more tree cover between the old and new neighborhoods*; and
- *The eastern portion of Woodlot S-23 (referred to in the EMP as the 'northeast forest') is the recommended location of the SWM Pond that will service the lands east of March Road. The remaining areas of Woodlot S-23 will be retained and conveyed to the City once the detailed design of the SWM pond has been confirmed.*

During development of the Commercial Blocks and the Minto Site, the tree retention recommendations of the KNUEA EMP will be implemented as follows:

- Where feasible, trees will be preserved within the open space blocks that will form the minimum 40 m wide corridors surrounding the North Tributary and the North Branch of Shirley's Brook. Wherever feasible, trees that already occur within the watercourse corridors will be preserved

during the installation of the habitat enhancement features, and habitat enhancement features will be placed to take advantage of existing openings;

- The construction of the Street #1 crossing through the north-south aligned portion of the 40 m wide North Tributary corridor will likely require tree removal where the corridor overlaps the future road footprint;
- Where compatible with the park and school designs, trees could also be preserved within the park and schools blocks. However, it should be noted that within the KNUEA Southeast Quadrant, the EMP did not identify retention of the vegetation communities that overlap the municipal park and school blocks (Novatech 2016b). As such, tree retention within these areas should not be considered a priority from a conservation perspective, and should only be prioritized where tree retention is deemed compatible and/or beneficial to the design of the parks and school. This may include:
    - The 2.62 ha Municipal Park Block (Block 513) overlaps portions of the Cultural Woodlot (Feature S). Depending on the requirements of the park design, it may be possible to retain portions of this feature;
    - The 0.4 ha Municipal Park Block (Block 512) overlaps portions of Deciduous Hedgerow K. Depending on the requirements of the park design, it may be possible to retain portions of this feature; and
    - The 2.52 ha School Block (Block 511) overlaps portions of the Fresh-Moist Poplar Deciduous Forest (Feature T) and the Fresh-Moist White Cedar Coniferous Forest/White Cedar Coniferous Swamp (Feature U). Depending on the requirements of the school design, it may be possible to retain portions of these features.
- The Deciduous Hedgerows (Features H and J) that occur along the southern boundary of the Minto Site were identified in the KNUEA EMP to be retained and/or enhanced. However, as noted above in Section 3.3, the condition of these hedgerows has significantly declined since the preparation of the KNUEA EMP. As noted in Section 3.3, the City of Ottawa Bylaw and Regulatory Services Department issued a letter to Minto Communities (dated May 8th, 2018) which identified the presence of dead White/Green Ash trees along the southern property line. The dead/dying White/Green Ash trees represented a concern, as they were present along the southern property line adjacent to the existing subdivision located to the south. Minto Communities responded to the City of Ottawa's letter by retaining a contractor to remove any dead/dying White/Green Ash trees. Tree removal was completed in June 2018. MES was asked by Minto Communities to prepare a letter documenting the rationale for tree removal and the condition of trees at the time. This letter is included in Appendix F. Following removal of the dead/dying ash trees, the current condition of Deciduous Hedgerows H and J is such that relatively little mature tree cover remains. Due to the fact that these features have been extensively degraded by the Emerald Ash Borer, they are no longer desirable for tree retention;

- The KNUEA Community Design Plan (CDP) and Environmental Management Plan (EMP) state that the western portion of Woodlot S-23 is to be retained as a natural heritage feature and conveyed to the City. Block 525 includes the approximately 2.4 ha retained portion of Woodlot S-23. However, it should be noted that the precise limits of the retained area of Woodlot S-23 will depend on the final detailed design of the SWM Pond, and hence may change as a result of detailed design. As described above in Section 2.0.1, a large tree inventory was undertaken in June 2019. The large tree inventory identifies the location, condition, and species of trees ≥50 cm dbh in size within Woodlot S-23. The large tree inventory will help guide the detailed design process for the SWM pond. The large tree inventory has been submitted to the City of Ottawa under separate cover. It is anticipated that the core of Woodlot S-23 will ultimately be retained. The inlet channels to the new SWM Pond will consist of buried pipes, which will be placed outside the limits of the retained portion of Woodlot S-23. Per the tree preservation mitigation measures described in Section 4.1.2, where feasible, the inlet pipes should be placed beyond the critical root zone of any boundary trees that occur along the edges of the retained portion of Woodlot S-23. This will ensure that the installation of the inlet pipes does not negatively impact the retained portion of Woodlot S-23; and
- The Commercial Blocks and the Minto Site are anticipated to be developed in multiple phases over several years. However, it is anticipated that the Commercial Blocks and the Minto Site will be cleared during the initial phase of development, as servicing and grading requirements are not anticipated to allow for phased tree removal.

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4.1.2 Tree Preservation Mitigation Measures (TCR)

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

- Mark the edge of the tree clearing area to ensure only designated trees are removed. Natural areas that are to be retained are to be isolated by sturdy construction fencing or similar barriers at least 1 m in height. The temporary Blanding's Turtle exclusion fencing described in Section 4.4.4 can also function as tree protection fencing;
- 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 tree;
- Ensure that exhaust fumes from all equipment are directed away from any tree canopy; and
- Disturbed areas of retained natural features should be replanted with locally grown native species.

4.1.3 Transplanting and Replanting (TCR)

In order to mitigate the loss of woody vegetation from tree clearing, trees and shrubs will be replanted selectively at the back and front of lots, and along roadways. 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 A. Planting of Ash trees should be avoided due to the high likelihood that any planted Ash trees will become infested with Emerald Ash Borer.

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4.2 Watercourses and Aquatic Habitats

4.2.1 Tributary Setbacks

The KNUEA Environmental Management Plan (EMP) establishes a minimum 40 m wide corridor of retained and/or enhanced habitat around the tributaries of Shirley's Brook (Novatech 2016b). Within the Minto Site, this corridor is provided by several connected open space blocks that separate the Commercial Blocks (owned by 2559688 Ontario Inc.) from the Minto Communities development. The open space blocks proposed within the Minto Site provide the 40 m wide watercourse corridor for the north-south aligned portion of the North Tributary. The future detailed Site Plan for the Commercial Blocks will be required to identify open space blocks to protect the west-east portions of the North Tributary and the North Branch, which run parallel to the northern and southern boundaries of the Commercial Blocks (respectively).

The portion of the North Tributary that runs through the Study Area will not be realigned as part of the proposed development, and hence it is anticipated that the existing sections of the North Tributary within the Study Area will be fully retained. As discussed below, it is anticipated that habitat enhancement features will be required within the 40 m wide watercourse corridor adjacent to the existing channel, in order to improve the quality of the aquatic habitat and riparian areas for Blanding's Turtles, amphibians, fish, and other wildlife.

The purpose of the minimum 40 m wide corridors surrounding the tributaries of Shirley's Brook is to provide a buffer which will help to slow, filter and absorb overland stormwater flow, while also providing habitat for wildlife and wildlife movement. Trees growing within the setback area help to protect the watercourse from edge effects including noise, pollution, and other forms of human disturbance. Trees also provide shade which helps to cool surface water temperatures, while they also help to prevent erosion, stabilize banks, and enhance absorption and filtration of overland stormwater flow.

As specified in Section 4.7.3 of the City of Ottawa Official Plan, current policy recommends that the setback from watercourses should be the greater of either 15 m from the top of slope or 30 m from the normal high-water mark of the watercourse. The minimum 40 m wide corridor surrounding the tributaries of Shirley's Brook established by the KNUEA EMP effectively requires implementation of a 20 m setback from the watercourses (on each side). The City of Ottawa Official Plan Policy 4.7.3 identifies four (4) items that are to be addressed in cases where watercourse setbacks are less than 30 m from the normal high-water mark. These include:

A. **Slope and Bank Stability:** Within the Study Area, no significant slope and bank stability issues have been identified (Novatech 2016b). The retention of existing vegetation within the 40 m corridor will help to minimize erosion potential.
B. **Natural Vegetation and Ecological Functions in the Setback Area:** Vegetation cover within the 40 m corridor will be retained in order to maintain ecological functions. As discussed below, habitat enhancement works are proposed to improve the habitat functionality for Blanding's Turtles, amphibians, fish, and other wildlife.
C. **The Nature of the Abutting Waterbody and the Presence of the Floodplain:** The floodplain of the North Tributary and the North Branch will be confined within the minimum 40 m wide watercourse corridors following development of the Study Area (Novatech 2016b).
D. **No Negative Impacts on Fish Habitat:** As discussed above, the North Tributary currently provides fish habitat for a tolerant warm-water fish community. The full length of the watercourse is being maintained, and hence there will be no direct loss of fish habitat. The proposed habitat enhancement works are intended to improve the quality of the habitat for fish (as well as other wildlife).

In summary, the minimum 40 m wide corridors surrounding the North Tributary and the North Branch are anticipated to be sufficient to protect the ecological functions of the watercourses. As part of the proposed development, habitat restoration and habitat enhancement works will be undertaken, which will improve the quality of the aquatic habitat above existing conditions.

Per the recommendations of the KNUEA EMP, the Ephemeral Farm Drainage Channels that run through the eastern portion of the Minto Site will be decommissioned, unless those channels fall within other designated retained areas (e.g. the retained portion of Woodlot S-23) (Novatech 2016b). The Ephemeral Farm Drainage Channels are not considered significant ecological features. Refer to MEP (2015) for a detailed discussion of management and mitigation recommendations for the Ephemeral Farm Drainage Channels. Mitigation measures to address the biological and hydrological functions of the Ephemeral Farm Drainage Channels are summarized below in Section 4.2.2 and 4.2.4.

4.2.2 North Tributary – Aquatic Habitat Enhancement Features

Habitat enhancement features for the Southeast Quadrant of the KNUEA were designed primarily to improve the quality of the North Tributary as habitat for Blanding's Turtle (DST 2015). However, as discussed below, the habitat enhancement features will also improve the quality of aquatic habitat for other organisms, including amphibians and fish. The KNUEA Environmental Management Plan (EMP) recommended that lost functions associated with Headwaters Drainage Features (e.g. the Ephemeral Farm Drainage Channels) should be replaced within the protected stream corridors (e.g. the minimum 40 m wide corridor surrounding the North Tributary). As discussed above in Section 3.4.3 and Section 3.6, fish and amphibian habitat functions (respectively), are extremely limited within the Ephemeral Farm Drainage Channels. As such, the habitat enhancement features described below are anticipated to be sufficient to replace the biological functions of the Ephemeral Farm Drainage Channels, in addition to providing habitat compensation for Blanding's Turtles. Mitigation related to the hydrological functions of the Ephemeral Farm Drainage Channels is discussed below in Section 4.2.4.

The *Kanata North Community Design Plan – Blanding's Turtle Habitat Compensation Plan* (DST 2015) and the KNUEA EMP (Novatech 2016b) outline in detail the proposed habitat enhancement works that are to be undertaken during development of the Southeast Quadrant. A Concept Plan showing the position and approximate size of the proposed habitat enhancement features is included below. For the purposes of this Combined Environmental Impact Statement (EIS) and Tree Conservation Report (TCR), and the Overall Benefit Permit(s) application for Blanding's Turtle, typically a conceptual design for the habitat enhancement features would be deemed sufficient. As shown below, it is anticipated that the habitat enhancement features will be installed adjacent to the existing channel (e.g. offline features), within the north-south aligned portion of the 40 m wide North Tributary corridor (within the Minto Site). This approach will avoid the need for in-water work. Additional detail, including grading and planting requirements, will be added to the Concept Plan at the detailed design stage. Typically the Overall Benefit Permit(s) is obtained prior to initiating the detailed design process for habitat enhancement features, as the Overall Benefit Permit(s) may contain provisions that need to be reflected in the final design. Following obtainment of the Overall Benefit Permit(s), a detailed design for the North Tributary habitat enhancement works will be developed and submitted to the City of Ottawa, the Mississippi Valley Conservation Authority (MVCA) and the Ministry of Environment, Climate Change, and Parks (MECP) for review and approval. The conceptual design for the North Tributary habitat enhancement features includes the following (Refer to DST (2015) and Novatech (2016b) for additional detail):

1. **Blanding's Turtle Category 1 Habitat Creation:** As discussed above in Section 3.7.3, Category 1 Blanding's Turtle habitat includes overwintering and nesting sites. A total of 0.1 ha of Category 1 habitat will be created within the watercourse corridor. This will include one (1) Deep Pool and one (1) Artificial Nesting Area. The design for these features is as follows:

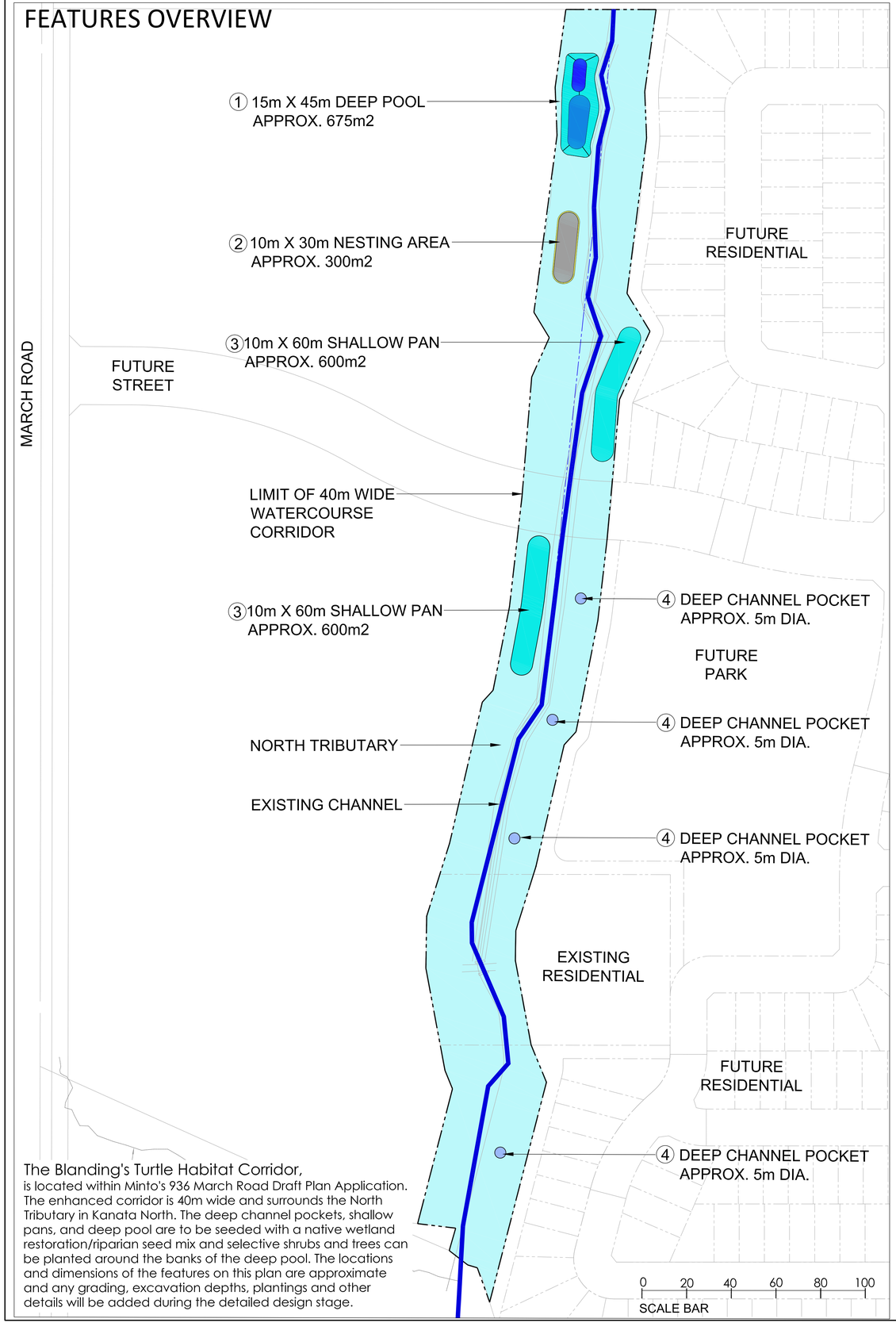
    a. **The Deep Pool** will function as a potential hibernacula site for Blanding's Turtles, while also providing general foraging, breeding, and refuge habitat for other aquatic wildlife (including amphibians and fish). The deep pool will measure approximately 15 m x 45 m (675 m^2) and will be designed as an offline pond. The pool will include the following:
        - The pool should have a maximum depth of approximately 2 m and an average depth of approximately 1 m.
        - Approximately 2/3^{rds} of the pool area will be 1 m water depth or greater, and graded so that the remaining 1/3rd of the area transitions to an approximate average depth of 30 cm.
        - The deep pool will include similar substrate and vegetation characteristics as the existing channel sections. The banks of the deep pool will be seeded with a native wetland restoration mix/riparian vegetation mix.

    b. **The Artificial Nesting Area** will create nesting habitat for Blanding's Turtles. The nesting area should measure approximately 10 m x 30 m (300 m^2) and should be built in a location that is likely to be dry throughout the nesting season (early June to late October). The nesting area will include the following:
        - The nesting area should be built near an existing tree line or near a planting site.
        - The nesting area should be on level ground with full southern exposure. Where possible, the site will be graded to approximately level conditions.
        - The nesting area should be above the spring/summer flood plain. The location of the nesting area shown in the Concept Plan (below) is outside the floodplain.
        - The nesting area should consist of a location with well-drained soil, sand or gravel. If natural substrate conditions do not meet this requirement, imported fill should consist of medium to coarse washed sand with <5% clay and <25% gravel, spread to a depth of approximately 30 cm.
        - Ground vegetation in the nesting area should be sparse and should include native sedges, grasses, and a few low growing shrubs. Shrub cover should be less than 2-5% of the nesting area.

2. **Blanding's Turtle Category 2 Habitat Creation:** As discussed above in Section 3.7.3, Category 2 Blanding's Turtle habitat includes watercourses and wetlands, and the surrounding terrestrial areas up to 30 m from the water's edge. The Category 2 habitat within the 40 m wide watercourse corridor will be enhanced by adding two (2) Shallow Pans/Shallow Pools and four (4) Deep Pockets. This will enhance approximately 0.13 ha of Category 2 habitat. The design for these features is as follows:
    a. **Shallow Pans/Shallow Pools** excavated adjacent to the channel will expand the wetted area and provide areas where aquatic and semi-aquatic vegetation can grow to create habitat for amphibians, turtles and other aquatic wildlife. Each shallow pan / shallow pool should measure approximately 10 m wide and approximately 60 m long (600 m^2).
        - Shallow pans / shallow pools will be dug to an average of approximately 30 cm below the channel grade, so that they maintain an average water depth of approximately 30 cm.
    b. **Deep Pockets** will be dug approximately 30 cm to 45 cm below the main channel grade. These features will be constructed along the length of the channel and will create deeper refuge pools adjacent to the channel for turtles, amphibians, fish and other aquatic wildlife.
        - Deep pockets will be relatively small (approximately 5 m diameter) and should be semi-randomly placed along the channel length.

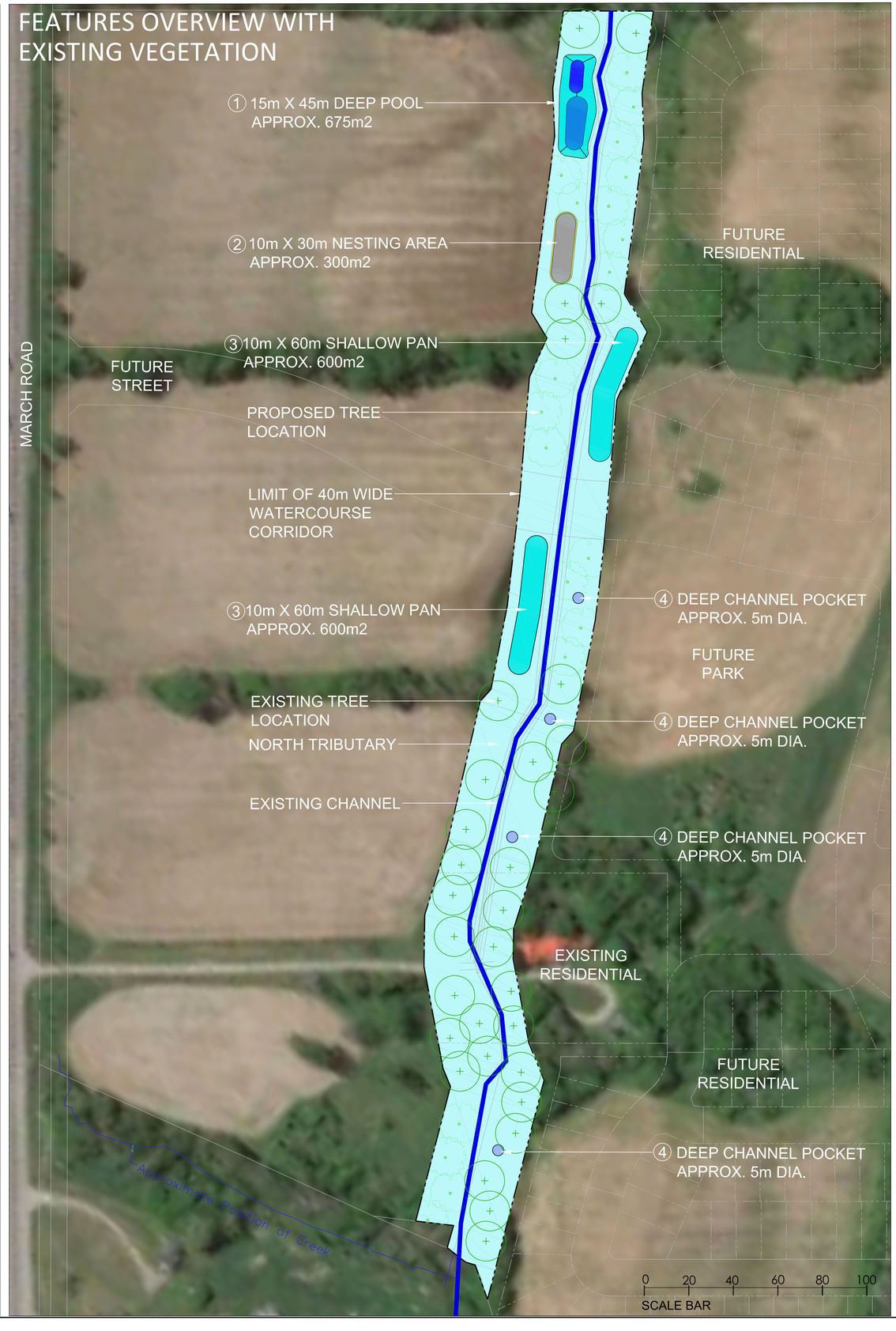
There are currently two (2) constrictions along the North Tributary within the Study Area. A 900 mm CSP culvert was installed historically by the farmer to control water levels from a beaver dam. The 900 mm CSP culvert will be removed during development of the Minto Site. The only water crossing that currently exists within the Study Area is the driveway to the farmhouse at 936 March Road, which crosses the North Tributary. The driveway includes a 1500 mm CSP culvert which is approximately 6.5 m long. The driveway/1500 mm CSP culvert cannot be removed, as the farmhouse will be retained and is within a separate block of land which is not part of the current development. The existing 1500 mm CSP culvert is large enough to allow the passage of Blanding's Turtles, fish, and other wildlife.

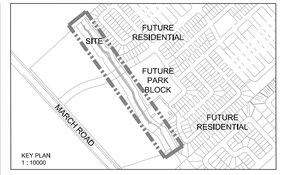
FEATURES OVERVIEW



The Blanding's Turtle Habitat Corridor,
is located within Minto's 936 March Road Draft Plan Application. The enhanced corridor is 40m wide and surrounds the North Tributary in Kanata North. The deep channel pockets, shallow pans, and deep pool are to be seeded with a native wetland restoration/riparian seed mix and selective shrubs and trees can be planted around the banks of the deep pool. The locations and dimensions of the features on this plan are approximate and any grading, excavation depths, plantings and other details will be added during the detailed design stage.

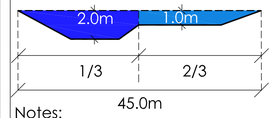
FEATURES OVERVIEW WITH EXISTING VEGETATION





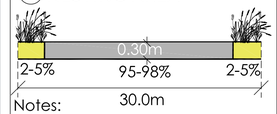
WETLAND FEATURES:

① DEEP POOL



Notes:
-15m x 45m (675m2)
-2/3 water depth =>1.0m
-1/3 water depth max. 2.0m

② NESTING AREA

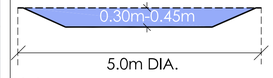


Notes:
-10m x 30m (300m2)
-shrub cover < 2-5% nesting area
-nesting area on level ground with coarse-washed sand spread to 0.30m

③ SHALLOW PAN

Notes:
-2 areas = 10m x 60m (600m2)
-dug to 0.30m below the channel grade to maintain 0.30m average water depth.

④ DEEP CHANNEL POCKET



Notes:
-deep pockets to be 5m DIA.
-to be dug 0.30cm to 0.45cm below main channel grade

MINTO-KANATA NORTH

CONCEPT PLAN
936 MARCH RD

HABITAT ENHANCEMENT
FEATURES - BLANDING'S TURTLE

NAK design strategies
250 BESSERER ST, SUITE 100 | OTTAWA ON | K1N 6B3
T 613.237.2345 | fax: (613) 237-6423 | info@nak-design.com

Date: MAY 10/19
Scale: 1:1000
24 x 36 ARCH D
Drawn: NAK

Dwg. No.:
P1

4.2.3 North Tributary – Wildlife Passage Culvert

As shown in the Draft Plan of Subdivision (above), Street #1 will cross the North Tributary. The future road crossing will include a suitable wildlife passage culvert that will allow Blanding's Turtles, fish, and other wildlife to pass beneath the new road. Per the KNUEA Environmental Management Plan (EMP) (Novatech 2016b), the wildlife passage culvert should include a box culvert that is a minimum of 1.8 m wide x 1.2 m high. As discussed below in Section 4.4.4, the minimum 40 m wide watercourse corridor will include fencing designed to prevent Blanding's Turtles from leaving the watercourse corridor to enter the development area. The fencing will be required to connect to the wildlife passage culvert, to ensure there are no gaps in the system. The detailed design of the wildlife passage culvert should address hydraulic connectivity, fish passage, and Blanding's Turtle movement requirements.

4.2.4 Servicing and Stormwater Management

Stormwater runoff will be addressed through construction of a new Stormwater Management (SWM) Pond. The new SWM Pond will be located east of the Former CN Railway Corridor within Block 526. The new SWM Pond will outlet clean water to Shirley's Brook east of March Valley Road. The inlet channels to the new SWM Pond will consist of buried pipes, which will be placed outside the limits of the retained portion of Woodlot S-23. Per the tree preservation mitigation measures described in Section 4.1.2, where feasible, the inlet pipes should be placed beyond the critical root zone of any boundary trees that occur along the edges of the retained portion of Woodlot S-23. This will ensure that the installation of the inlet pipes does not negatively impact the retained portion of Woodlot S-23. The KNUEA Environmental Management Plan (EMP) also states that the recommended SWM facility design will incorporate baseflow enhancement, water quality control (80% long-term TSS removal), erosion control, and peak flow control (Novatech 2016b).

The KNUEA EMP included several recommendations related to mitigating the hydrological impacts of removing the Ephemeral Farm Drainage Channels (e.g. Headwaters Drainage Features) (Novatech 2016b). Mitigation measures pertaining to the hydrological functions of the Ephemeral Farm Drainage Channels will be addressed by the stormwater management and servicing studies. The stormwater management and servicing studies will also consider Low Impact Development (LID) options, in order to mitigate impacts to the water balance of the Study Area.

4.2.5 Sediment and Erosion Controls

As discussed below in Section 4.4.4, Blanding's Turtle temporary exclusion fencing (wire re-enforced silt fencing) will be required surrounding the watercourse corridor open space blocks during the construction phase. In addition to preventing Blanding's Turtles from entering the development area, this fencing will also serve to mitigate potential sediment and erosion impacts on the North Tributary and the North Branch.

During construction, existing conveyance systems along March Road and in the existing developed properties 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 March Road, 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 Commercial Blocks and the Minto 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.

4.3 Adjacent Lands and Significant Features

Adjacent lands and adjacent significant features are discussed above in Section 3.5. The significant adjacent features are addressed by the mitigation measures discussed above in Section 4.1 and 4.2. No additional mitigation measures are required for adjacent lands.

4.4 Wildlife and Species at Risk

4.4.1 Butternut Tree Mitigation and Regulatory Requirements (TCR)

As discussed above in Section 3.7.2, a total of 127 Category 2 Butternut Trees and 22 Category 3 Butternut Trees were identified within the Study Area during the 2018 Butternut Health Assessment (Refer to Appendix D). It is anticipated that several Category 2 Butternut Trees will be preserved within the 40 m wide watercourse corridor surrounding the North Tributary. In addition, Category 3 Tree #103 occurs within the parcel surrounding the farmhouse at 936 March Road, and hence is anticipated to be retained. A significant portion of the Category 3 trees (approximately half) will be preserved within Block 525, which preserves the western portion of Woodlot S-23. The retained Butternut Trees will be protected by implementing the tree protection measures noted above in Section 4.1. Ontario Ministry of Natural Resources and Forestry (OMNRF) guidelines state that a buffer of 25 m surrounding a Butternut Tree is required for that tree to be considered un-impacted by development activities. Butternut habitat is defined as the area up to 50 m surrounding a Butternut Tree.

Development of the Commercial Blocks and the Minto Site will both result in the removal of several Butternut Trees that fall within the development footprint, impacts to additional Butternut Trees within 25 m, and removal of associated Butternut habitat (the area within 50 m of Butternut Trees). Due to the number of trees affected, it is anticipated that the development of the Commercial Blocks and the Minto Site will require an Overall Benefit Permit(s) under Section 17(2)(C) of the Ontario Endangered Species Act. As part of the Overall Benefit Permit process, impacts to Butternut Trees and their habitat will be quantified in detail and submitted to the Ministry of Environment, Climate Change, and Parks (MECP) for review. The Overall Benefit Permit(s) will require compensation for impacts to Butternut Trees, which typically includes some combination of archiving Category 3 trees, planting healthy Butternut seedlings, and/or collecting Butternut seeds. Compensation requirements will be determined in consultation with the MECP through the permitting process.

4.4.2 Blanding's Turtle Habitat Impacts

As noted above, consultation with the Ontario Ministry of Natural Resources and Forestry (OMNRF) culminated in acceptance of Blanding's Turtle habitat mapping which shows the extent of habitat throughout the KNUEA (DST 2015). There have been no significant changes to the Blanding's Turtle habitat since completion of the habitat mapping exercise. DST (2015) also quantified impacts to Blanding's Turtle habitat for the Study Area. However, division of the Study Area between two (2) landowners (2559688 Ontario Inc. and Minto Communities) necessitates that impacts to the habitat be updated to reflect the new ownership and development boundaries. Previously, impacts were calculated assuming the entire Study Area would be developed by a single landowner (DST 2015).

As described above, Minto Communities is responsible for development of the Minto Site, which includes construction of Street #1, extension of Street #1 through the 40 m wide north-south aligned portion of the North Tributary corridor, residential development east of the 40 m wide North Tributary corridor, and construction of the Stormwater Management (SWM) Pond. 2559688 Ontario Inc. will develop the Commercial Blocks.

It should be noted that the quantification of habitat impacts outlined below is based on the Draft Plan of Subdivision, which provides a detailed layout of the Minto Site development. The quantification of habitat impacts for the Commercial Blocks was completed based on the conceptual limits of the Commercial Blocks, as shown in the Draft Plan of Subdivision. As noted above, a detailed Site Plan for the development of the Commercial Blocks was not available at the time of report preparation. As such, the quantification of habitat impacts for the Commercial Blocks may require revision in future in order to match the detailed Site Plan, particularly with regards to the final boundaries of the open space blocks that will be required to provide the 40 m wide corridor for the west-east sections of the North Tributary and the North Branch. The impacts to Blanding's Turtle habitat associated with the development is quantified as follows:

- **Category 1 Habitat:** No Category 1 habitat present.
- **Minto Site - Category 2 Habitat:**
    - A) The north-south aligned portion of the 40 m wide corridor surrounding the North Tributary will result in a loss of Category 2 habitat. This is due to the fact that Category 2 habitat extends 30 m on each side of the watercourse, whereas the 40 m wide corridor only affords 20 m of habitat retention on each side of the feature. Minto Communities is responsible for the loss of habitat on the east side of the north-south aligned portion of the 40 m wide corridor, as their development occurs only on the east side of the North Tributary (with the exception of Street #1, discussed below). Category 2 habitat loss on the east side of the corridor is calculated by multiplying the length of Minto

Communities' frontage along the watercourse corridor by 10 m (the width of Category 2 habitat lost). The length of Minto Communities frontage was measured as shown on the Draft Plan of Subdivision. It should be noted that the position of the watercourse, and the limits of the 40 m corridor, were verified in the field by MES and a land surveyor in April 2018. Minto Communities' frontage excludes the portion of the 40 m wide corridor that passes through the parcel surrounding the farmhouse at 936 March Road (since this area is not within the current development), and it also excludes the area where Street #1 will cross the corridor (as impacts from the road are counted separately in the next bullet). With these factors accounted for, Minto Communities' frontage length along the corridor is 496 m. Multiplied by the width of Category 2 habitat lost (10 m), the loss of habitat is 0.496 ha.

- B) The footprint of Street #1 where it crosses the 40 m wide watercourse corridor will remove Category 2 habitat. Street #1 is shown as 26 m wide and will span the entire width of the Category 2 habitat, thereby removing an area 60 m deep. Multiplying these numbers together, the loss of habitat is 0.156 ha.
- ***The total loss of Category 2 habitat within the Minto Site is hence 0.496 ha + 0.156 ha = approximately 0.65 ha.***

- **Commercial Blocks - Category 2 Habitat:**
  - A) The north-south aligned portion of the 40 m wide corridor surrounding the North Tributary will result in a loss of Category 2 habitat. This is due to the fact that Category 2 habitat extends 30 m on each side of the watercourse, whereas the 40 m corridor only affords 20 m of habitat retention on each side of the feature. 2559688 Ontario Inc. is responsible for the loss of habitat on the west side of the north-south aligned portion of the 40 m wide corridor, as their development occurs only on the west side of the North Tributary. Category 2 habitat loss on the west side of the corridor is calculated by multiplying the length of 2559688 Ontario Inc.'s frontage along the watercourse corridor by 10 m (the width of Category 2 habitat lost). 2559688 Ontario Inc.'s frontage includes the portion of the 40 m wide corridor that passes west of the farmhouse parcel, due to the fact that the farmhouse parcel only includes a 20 m setback from the North Tributary on its west side (whereas the parcel is wider than this on its east side, where it faces the Minto Site's frontage). The final boundary of the open space blocks that will be required to provide the 40 m wide corridor for the west-east sections of the North Tributary and the North Branch will need to be verified as part of the detailed Site Plan for the Commercial Blocks. However, the frontage of the northern and southern edges of the Commercial Blocks along the North Tributary and the North Branch (respectively) can been estimated based on the limits of the Commercial Blocks shown on the Draft Plan of Subdivision. As noted above, the impact of Street #1 where it will cross the 40 m corridor

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has been attributed to the development of the Minto Site. With these factors accounted for, 2559688 Ontario Inc.'s total frontage length is approximately 932 m (including the west side of the north-south aligned North Tributary corridor, and the frontage along the west-east aligned North Tributary and North Branch corridors). Multiplied by the width of Category 2 habitat lost along each corridor (10 m), the loss of habitat is 0.93 ha.

- ***The total loss of Category 2 habitat within the Commercial Blocks is hence approximately 0.93 ha.***

- **Minto Site - Category 3 Habitat:**
  - A) The loss of habitat due to development of the Minto Site east of the 40 m wide watercourse corridor is shown by DST (2015) as 13.85 ha. However, 0.43 ha of this occurs within the parcel surrounding the farmhouse at 936 March Road. The loss of habitat due to development of the Minto Site is hence 13.85 ha – 0.43 ha = 13.42 ha.
  - B) The development of Street #1 west of the 40 m wide North Tributary corridor will remove 0.56 ha of habitat.
  - C) The SWM Pond will remove 3.66 ha of Category 3 habitat.
  - ***The total loss of Category 3 habitat within the Minto Site is hence 13.42 ha + 0.56 ha + 3.66 ha = approximately 17.64 ha.***
- **Commercial Blocks - Category 3 Habitat:**
  - A) The loss of habitat due to development of the Commercial Blocks west of the 40 m wide watercourse corridor is shown by DST (2015) as 8.98 ha. However, 0.56 ha of the Category 3 habitat will be removed by the development of Street #1, which has been attributed to the Minto Site. The loss of habitat due to development of the Commercial Blocks is hence 8.98 ha – 0.56 ha = 8.42 ha.
  - ***The total loss of Category 3 habitat within the Commercial Blocks is hence 8.98 ha - 0.56 ha = approximately 8.42 ha.***

Habitat that will be retained as part of the development of the Commercial Blocks and the Minto Site includes the Category 2 habitat that remains within the 40 m wide North Tributary and North Branch corridors, and approximately 7.51 ha of Category 3 habitat that is located within the undeveloped area south of the SWM Pond (east of the Former CN Railway Corridor – within the Minto Site).

4.4.3 Blanding's Turtle Habitat Compensation Requirements

As discussed above in Section 4.2.2, DST (2015) and Novatech (2016b) recommended that habitat enhancement work should be completed in order to improve the quality of habitat within the retained 40 m wide watercourse corridor. Habitat enhancement activities will serve to mitigate the loss of Category 2 habitat. It was recommended that within the Study Area (the KNUEA Southeast Quadrant), one (1) deep pool, one (1) artificial nesting area, two (2) shallow pans/pools, and four (4) deep pockets should be constructed within the 40 m wide watercourse corridor (Refer to Section 4.2.2). Construction of these features will add approximately 0.1 ha of Category 1 habitat (Deep Pools and Artificial Nesting Areas) while enhancing approximately 0.13 ha of Category 2 habitat (Shallow Pans/Pools and Deep Pockets). As noted above, it is anticipated that these features will be installed within the open space blocks of the north-south aligned portion of the North Tributary (e.g. within the Minto Site). As such, the net benefit associated with the installation of habitat enhancement features will be attributed to the Minto Site, helping to offsite the loss of habitat associated with the Minto Site development.

The net loss of habitat associated with the Minto Site development is calculated by taking the total habitat loss and adding habitat created through habitat enhancement. This comes out as follows:

- **Minto Site Category 1 Habitat: -**0.0 ha (Habitat Loss) + 0.1 ha (Habitat Enhancement) = +0.1 ha
- **Minto Site Category 2 Habitat: -**0.65 ha (Habitat Loss) + 0.13 ha (Habitat Enhancement) = -0.52 ha
- **Minto Site Category 3 Habitat:** -17.64 ha (Habitat Loss) + 0.00 ha (Habitat Enhancement) = -17.64 ha

The habitat enhancement features will help to mitigate the loss of Category 2 habitat within the Minto Site by adding Category 1 habitat and by improving some areas of retained Category 2 habitat. However, this will not be sufficient to mitigate all habitat impacts, and a net loss of Category 2 and 3 habitat within the Minto Site is anticipated. It should be noted that a net loss of Category 2 habitat of -0.52 ha is relatively small compared to similar developments in the region. In addition, although -17.64 ha of Category 3 habitat is anticipated to be removed within the Minto Site, much of this is currently Cultivated Fields. Although Blanding's Turtles may be capable of traversing these areas, they are relatively inhospitable and hazardous. Blanding's Turtles traversing the KNUEA are more likely to follow the tributaries of Shirley's Brook, rather than moving overland, and hence most of the Category 3 habitat is unlikely to provide any significant habitat function. As noted above, the development of the Commercial Blocks is anticipated to result in an additional loss of Category 2 and 3 habitat of approximately -0.93 ha and -8.42 ha (respectively).

DST (2015) discusses in detail how the potential loss of habitat may impact the regional population of Blanding's Turtles. As noted above, comparatively few Blanding's Turtles have been found within the Study Area and the remainder of the KNUEA. The existing Category 2 habitat within the Study Area is comparatively small and degraded, and the Study Area provides comparatively little core wetland habitat compared to the nearby South March Highlands and Shirley's Bay, where larger regional sub-populations of Blanding's Turtles are found. DST (2015) conclude that the main ecological significance of the Study Area is afforded by its position approximately halfway between the comparatively large sub-populations of Blanding's Turtles found to the west (in the South March Highlands) and to the east (around Shirley's Bay). The KNUEA, and in particular the tributaries of Shirley's Brook, may provide a linkage between the major adjacent sub-populations, even though travelling from Shirley's Bay to the South March Highlands (or vice versa) would require a Blanding's Turtle to traverse large expanses of poor quality habitat, while exposing itself to a significant risk of road mortality as it crosses Old Second Line Road, Carp Road, March Road, March Valley Road, and other roadways.

It is likely that the tributaries of Shirley's Brook provide the main viable movement corridor through the KNUEA for Blanding's Turtle under current conditions. It is also likely that adjacent upland areas shown as Category 3 habitat offer only a hazardous movement corridor with little functional benefit. As such, DST (2015) recommended that mitigation and/or habitat compensation within the KNUEA should focus on: A) Enhancing the quality of habitat within the riparian corridors surrounding the tributaries of Shirley's Brook; and B) Reducing road mortality, both within the KNUEA and in adjacent areas. Within the Study Area itself, these management priorities are addressed by enhancing the quality of habitat of the North Tributary (discussed above), and by fencing the minimum 40 m wide watercourse corridor (described below).

Due to the presence of Blanding's Turtle and Butternut, an Overall Benefit Permit(s) under Clause 17(2)(C) of the Ontario Endangered Species Act (ESA) will be required to support development. Due to the fact that many areas of Butternut and Blanding's Turtle habitat are overlapping within the Study Area, it is anticipated that both species will be addressed through a combined permit(s) application. Depending on the schedule of development, the Ontario ESA requirements for the development of the Southeast Quadrant of the KNUEA may be addressed either by obtaining separate Overall Benefit Permits for the development of the Commercial Blocks and the Minto Site, or by obtaining a single combined permit for the entire quadrant. The permitting approach will be determined in future through discussion with the landowners and the Ministry of Environment, Climate Change, and Parks (MECP). The Overall Benefit Permit(s) will require the proponents to offset the net loss of Blanding's Turtle habitat through offsite habitat compensation measures.

Several options for offsite habitat compensation have previously been discussed with the Ontario Ministry of Natural Resources and Forestry (OMNRF). These include the following:

- Measures to reduce road mortality in adjacent areas with high rates of Blanding's Turtle road deaths. In particular, the possibility of installing a wildlife passage culvert and an associated fencing system on March Valley Road (east of the Study Area) has been discussed. This may help to reduce road mortality, but also to direct turtles to move north of the KNUEA, through undeveloped lands beyond the urban boundary;
- Creation of new Category 1 or 2 habitat in offsite areas; and
- Funding of research programs to study and advance the conservation of Blanding's Turtle.

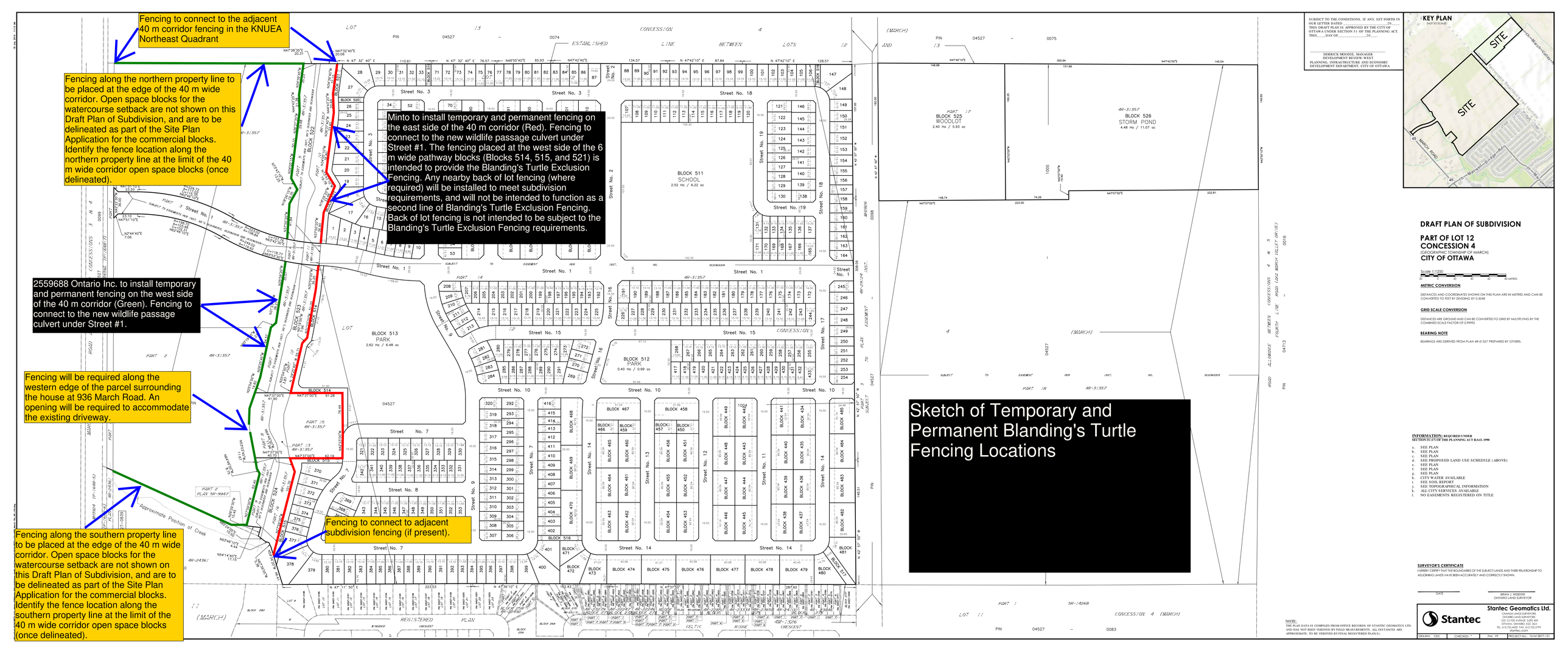
One or more of the options listed above may be pursued to provide the required habitat compensation. The location and configuration of offsite habitat compensation measures for Blanding's Turtle will be determined in consultation with the MECP, through the Overall Benefit Permit(s) application and review process. Mitigation measures to protect individual Blanding's Turtles during development are discussed below in Section 4.4.5.

4.4.4 Blanding's Turtle Temporary and Permanent Exclusion Fencing

Per the KNUEA Environmental Management Plan (EMP) (Novatech 2016b), Blanding's Turtle exclusion fencing will be required throughout the KNUEA surrounding the open space blocks that form the minimum 40 m wide watercourse corridors, in order to mitigate the risk that Blanding's Turtles may leave the corridors to enter the subdivision and/or roads.

A sketch showing the approximate position of fencing within the Commercial Blocks and the Minto Site is included below. However, it should be noted that the final fencing configuration will be determined in consultation with the Ministry of Environment, Climate Change, and Parks (MECP) as part of the Overall Benefit Permit process, with the final location of fencing to be confirmed at the detailed design stage. As shown in the fencing sketch, fencing will be required at the development edge adjacent to the open space blocks that will form the 40 m wide North Tributary and North Branch corridors. Fencing will be required to tie into the new wildlife passage culvert under Street #1. Fencing should also tie into the adjacent Blanding's Turtle exclusion fencing that is to be installed to the north within the KNUEA Northeast Quadrant, as well as any fencing that is present surrounding the existing subdivision that is south of the Minto Site. 2559688 Ontario Inc. and Minto Communities should be responsible for installing the fencing surrounding their respective development areas.

Temporary fencing will be required at the construction stage. The temporary fencing should be maintained and remain in place until the permanent fencing can be installed. Temporary fencing installed at the construction stage typically consists of wire re-enforced silt fencing that is buried at the bottom. Permanent fencing may consist of several different configurations, as described by Ontario Ministry of Natural Resources and Forestry (OMNRF) guidance documents (Gunson et al. 2016). Generally, permanent Blanding's Turtle exclusion fencing must consist of a barrier a minimum of 60 cm tall that is buried into the ground and which is impassable to Blanding's Turtle of all sizes. The fencing material is typically required to be durable with little maintenance for a minimum of fifteen (15) years. Products typically used may include some combination of: A) Stone retaining walls or gabion baskets 60 cm tall; B) Chain link fencing with plastic inserts; or C) Purpose built Blanding's Turtle exclusion fencing constructed from plastic sheeting or wire mesh. The fencing configuration and materials will be required to allow overland water flow towards the minimum 40 m wide North Tributary corridor. At the detailed design stage, any grading and/or drainage constraints that may affect the design of the fencing will be addressed. The specific requirements for permanent fencing will be outlined by the Overall Benefit Permit(s), and the final design and configuration will be developed at the detailed design stage.



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
NOT TO SCALE

DRAFT PLAN OF SUBDIVISION

PART OF LOT 12 CONCESSION 4
(GEOGRAPHIC TOWNSHIP OF MARCH)
CITY OF OTTAWA

Scale 1:1250
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

GRID SCALE CONVERSION

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.9999

BEARING NOTE

BEARINGS ARE DERIVED FROM PLAN 4R-31357 PREPARED BY OTHERS.

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. NO EASEMENTS REGISTERED ON TITLE

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:
THE 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
Stantec Geomatics Ltd.
CANADA LAND SURVEYORS
ONTARIO LAND SURVEYORS
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OTTAWA, ONTARIO, K2C 3G4
TEL: 613.722.4420 FAX: 613.722.2799
stantec.com

DRAWN: CJC | CHECKED: * | PM: PP | PROJECT NO.: 161613077-131

4.4.5 Species at Risk and Wildlife Construction Stage Mitigation - Terrestrial

Potential impacts to Blanding's Turtle and other 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 hoarding or sediment and erosion control fencing.

Mitigation for Species at Risk (SAR) and wildlife during construction is summarized here. These recommendations include provisions from the City of Ottawa (2015) *Protocol for Wildlife Protection During Construction*, as well as requirements specific to Blanding's Turtle:

- **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 open space blocks and/or adjacent areas of retained habitat, in order to provide an opportunity for wildlife to leave the area;
- **Temporary Exclusion Fencing:** As described above, temporary Blanding's Turtle exclusion fencing (wire re-enforced silt fencing) will be required to mitigate the risk of Blanding's Turtles entering the construction site. The fencing requirements are described above. The fencing will also mitigate risks for other wildlife including frogs, snakes, and other species of turtles;
- **Inspections:** Construction stage monitoring will include, at a minimum, weekly inspections by a Qualified Biologist during initial tree clearing, the installation of mitigation measures, the installation of habitat enhancement features within the 40 m wide North Tributary corridor, and other critical/high risk work phases. As noted below, full time monitoring by a Qualified Biologist during dewatering is required;
- **Sweeps:** Prior to vegetation clearing, preconstruction sweeps of vegetated areas will be undertaken by a Qualified Biologist to ensure Blanding's Turtle and other wildlife are not present. A designated staff member will be required to conduct daily sweeps each morning prior to commencement of work to ensure wildlife have not entered the work area. The designated staff member will also periodically inspect the temporary exclusion fencing to ensure there are no gaps or holes in the fence;
- **Awareness Training:** Contractor awareness training packages will be prepared and utilized to complete contractor awareness training. Each contractor will be required to have at least one (1) staff member on site at all times who has completed the training. The Awareness Training will

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include a summary of the required mitigation measures, training on emergency procedures to relocate Blanding's Turtles, and training on the identification of Blanding's Turtles, Butternut Trees and other SAR;

- **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 SAR and stop safely to avoid species;
- **Equipment Washing:** All equipment shall be washed, refueled, and serviced to prevent fuel and other deleterious substances from entering wetlands and watercourses. Any machinery operated within the high water mark of a wetland or waterbody must arrive on site in a clean condition and shall be maintained free of fluid leaks, invasive species, and noxious weeds;
- **Spills:** A spill response plan should be developed. The spill response plan is to be implemented in the event of a sediment release or spill of a deleterious substance. An emergency kit should be kept on site any time development activities are taking place;
- **SAR Encounters:** If 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 Ministry of Environment, Climate Change, and Parks (MECP) 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 turtles and other 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 Blanding's Turtle active season is defined by the OMNRF as April 15th to October 15th each year. The Temporary Exclusion Fencing must be installed prior to work that would occur during the Blanding's Turtle active season;
    - The core migratory bird nesting season is defined as April 15th to August 15th each year; and
    - Therefore, initial vegetation clearing, stripping, and installation of temporary exclusion fencing must be undertaken between October 16th and April 15th.

4.4.6 Species at Risk and Wildlife Construction Stage Mitigation - Aquatic

In addition to those mitigation measures outlined above, the following requirements apply to any in-water work:

- **Dewatering:** All dewatering operations must be supervised by a Qualified Biologist, who must be present during dewatering to relocate fish, turtles and other wildlife. Full time supervision by a Qualified Biologist is necessary during initial water draw down;
- **Permits:** Prior to dewatering any areas that may contain fish and/or other aquatic wildlife, 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, reptiles, and amphibians 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
- **Inspections:** Once dewatering is complete, weekly construction stage inspections by a Qualified Biologist must be undertaken throughout the duration of any in-water works, including during the installation of all habitat enhancement features within the 40 m wide watercourse corridor.

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5.0 CUMULATIVE EFFECTS

Cumulative effects were considered in the design of the mitigation measures outlined in Section 4.0, particularly in the creation of Species at Risk (SAR) mitigation measures. The Endangered Species Act (ESA) 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. Mitigation and compensation measures to provide an overall benefit to Blanding's Turtle and Butternut will be determined in consultation with the Ministry of Environment, Climate Change, and Parks (MECP) through the Overall Benefit Permit process. Mitigation measures to address the potential loss of biological and hydrological functions associated with the removal of the Ephemeral Farm Drainage Channels (e.g. Headwaters Drainage Features) are discussed in Sections 4.2.2 and 4.2.4.

6.0 ADDITIONAL STUDIES

As described above in Section 2.0.1, a separate large tree inventory was undertaken in June 2019. The large tree inventory identifies the location, condition, and species of trees ≥50 cm dbh in size within Woodlot S-23. The large tree inventory results have been provided to the City of Ottawa under separate cover.

7.0 MONITORING

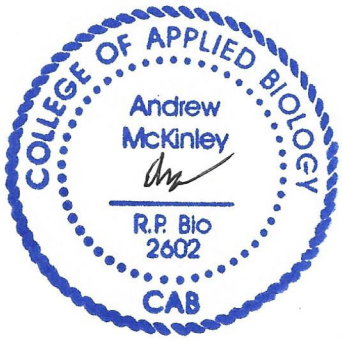
Construction stage monitoring requirements are outlined in Section 4.4.5 and 4.4.6 (above). Construction stage monitoring will include pre-construction sweeps to inspect fencing and vegetation prior to clearing, daily sweeps by construction staff, and full time supervision by a biologist during dewatering.

For previous Overall Benefit Permits, Blanding's Turtle monitoring requirements have typically included five (5) years of post construction mitigation, population, exclusion fencing, and habitat compensation monitoring. Monitoring requirements related to Blanding's Turtle will be determined in consultation with the Ministry of Environment, Climate Change, and Parks (MECP) through the Ontario Endangered Species Act authorization and review process.

8.0 CLOSURE

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

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9.0 REFERENCES

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APPENDIX A

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
Broadleaf Arrowhead (Wapato)	Sagittaria latifolia	S5	Common	Aquatic
Common Cattail	Typha latifolia	S5	Common	Aquatic
Lady Fern	Athyrium filix-femina	S5	Common	Fern
Ostrich Fern	Matteuccia struthiopteris	S5	Common	Fern
Sensitive Fern	Onoclea sensibilis	S5	Common	Fern
Awnless Brome	Bromus inermis	SNA	Common	Grass
Brome Grass	Bromus sp.		n/a	Grass
Orchard Grass	Dactylis glomerata	SNA	Common	Grass
Barnyard Grass	Echinochloa crusgalli	SNA	Common	Grass
Reed Canary Grass	Phalaris arundinacea	SE5	Common (locally abundant introduction)	Grass
Timothy	Phleum pratense	SNA	Common	Grass
Meadow Grass sp.	Poa sp.		Common	Grass
Green Foxtail	Setaria viridis	SNA	Common	Grass
White Snakeroot	Ageratina altissima	S5	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
Mugwort	Artemisia vulgaris	SNA	Common	Herbaceous
Wild Ginger	Asarum canadense	S5	Common	Herbaceous
Common Milkweed	Asclepias syriaca	S5	Common	Herbaceous
Yellow Rocket	Barbarea vulgaris	SNA	Common	Herbaceous
Lamb's Quarters Pigweed	Chenopodium album	SNA	Common	Herbaceous
Chickory	Cichorium intybus	S5	Common	Herbaceous
Broadleaf Enchanter's Nightshade	Circaea canadensis	S5	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
Viper's Bugloss	Echium vulgare	SNA	Common	Herbaceous
Daisy Fleabane	Erigeron annuus	S5	Common	Herbaceous
Philadelphia Fleabane	Erigeron philadelphicus	S5	Common	Herbaceous
Trout Lily	Erythronium americanum	S5	Common	Herbaceous
Spotted Joe Pye Weed	Eutrochium maculatum	S5	Common	Herbaceous
Common Strawberry	Fragaria virginiana	S5	Common	Herbaceous
White Bedstraw	Galium mollugo	SNA	Common	Herbaceous
White Avens	Geum canadense	S5	Common	Herbaceous
Yellow Hawkweed	Hieracium caespitosum	SNA	Uncommon	Herbaceous
Spotted Touch Me Not	Impatiens capensis	S5	Common	Herbaceous
Elecampane	Inula helenium	SNA	Common	Herbaceous
Ox-eye Daisy	Leucanthemum vulgare	SNA	Common	Herbaceous
Butter-and-eggs	Linaria vulgaris	SNA	Common	Herbaceous
Bird's-foot Trefoil	Lotus corniculatus	SNA	Common	Herbaceous
Purple Loosestrife	Lythrum salicaria	SNA	Common (invasive)	Herbaceous
Pineappleweed	Matricaria discoidea	SNA	Common	Herbaceous
Black Medic	Medicago lupulina	SNA	Common	Herbaceous
White Sweet Clover	Melilotus albus	SNA	Common	Herbaceous
Yellow Woodsorrel	Oxalis stricta	S5	Common	Herbaceous
Wild Parsnip	Pastinaca sativa	SNA	Common	Herbaceous
Common Plantain	Plantago major	S5	Common	Herbaceous
Self Heal	Prunella vulgaris	S5	Common	Herbaceous
Common Buttercup	Ranunculus acris	SNA	Common	Herbaceous
Black Eyed Susan	Rudbeckia hirta	SU	Common	Herbaceous
Curled Dock	Rumex crispus	SNA	Common	Herbaceous
Bloodroot	Sanguinaria canadensis	S5	Common	Herbaceous
White Cockle	Silene latifolia	SNA	Uncommon	Herbaceous
Bladder Campion	Silene vulgaris	SNA	Common	Herbaceous
Wild Mustard	Sinapis arvensis	SNA	Common	Herbaceous
Bittersweet Nightshade	Solanum dulcamara	SNA	Common	Herbaceous
Canada Goldenrod	Solidago canadensis	S5	Common	Herbaceous

Sow Thistle	Sonchus arvensis	SNA	Common	Herbaceous
Narrow Leaved Meadowsweet	Spiraea alba	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
Poison Ivy	Toxicodendron rydbergii	S5	Common	Herbaceous
Goat's-beard	Tragopogon dubius	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 Stinging Nettle	Urtica dioica	SNA	Common	Herbaceous
Common Mullein	Verbascum thapsus	SNA	Common	Herbaceous
Tufted Vetch	Vicia cracca	SNA	Common	Herbaceous
Downy Yellow Violet	Viola pubescens	S5	Common	Herbaceous
Common Horsetail	Equisetum arvense	S5	Common	Horsetail
Red Baneberry	Actaea rubra	S5	Common	Shrub
Alternate Leaved Dogwood	Cornus alternifolia	S5	Common	Shrub
Red Osier Dogwood	Cornus sericea (stolonifesa)	S5	Common	Shrub
Hawthorn	Crataegus chrysocarpa	S5	Common	Shrub
Glossy Buckthorn	Frangula alnus	SNA	Common (aggressive invasive)	Shrub
Ground Juniper	Juniperus communis	S5	Common	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
Black Currant	Ribes americanum	S5	Common	Shrub
Prickly Gooseberry	Ribes cynosbati	S5	Common	Shrub
Wild Red Raspberry	Rubus idaeus	S5	Common	Shrub
Purple Flowering Raspberry	Rubus odoratus	S5	Common	Shrub
Bebb's Willow	Salix bebbiana	S5	Common	Shrub
Slender Willow	Salix petiolaris	S5	Common	Shrub
Red Elderberry	Sambucus racemosa	S5	Common	Shrub
Lilac	Syringa vulgaris	SNA	Common	Shrub

Prickly Ash	Zanthoxylum americanum	S5	Common	Shrub
Manitoba Maple	Acer negundo	S5	Common	Tree
Red Maple	Acer rubrum	S5	Common	Tree
Sugar Maple	Acer saccharum	S5	Common	Tree
Yellow Birch	Betula alleghaniensis	S5	Common	Tree
White Birch	Betula papyrifera	S5	Common	Tree
Bitternut Hickory	Carya cordiformis	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
White Spruce	Picea glauca	S5	Common	Tree
Eastern White Pine	Pinus strobus	S5	Common	Tree
Scots Pine	Pinus sylvestris	SNA	Rare (frequently planted)	Tree
Balsam Poplar	Populus balsamifera	S5	Common	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
Staghorn Sumac	Rhus hirta	S5	Common	Tree
Weeping Willow	Salix alba	SNA	Uncommon	Tree
Pussy Willow	Salix discolor	S5	Common	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
Hog-peanut	Amphicarpaea bracteata	S5	Common	Vine
Wild Cucumber	Echinocystis lobata	S5	Common	Vine
Ground-ivy	Glechoma hederacea	SNA	Common	Vine
Virginia Creeper	Parthenocissus vitacea	S5	Common	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 B

Bird and Wildlife Sightings

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TABLE B: BIRDS	
Common Name	**Scientific Name**
Spotted Sandpiper	Actitis macularia
Red-winged Blackbird	Agelaius phoeniceus
Mallard	Anas fulvigula
Great Blue Heron	Ardea herodias
Cedar Waxwing	Bombycilla cedrorum
Ruffed Grouse	Bonasa umbellus
Canada Goose	Branta canadensis
Red-tailed Hawk	Buteo jamaicensis
Broad-winged Hawk	Buteo platypterus
Northern Cardinal	Cardinalis cardinalis
Turkey Vulture	Cathartes aura
Veery	Catharus fuscescens
Killdeer	Charadrius vociferus
Black-billed Cuckoo	Coccyzus erythropthalmus
Northern Flicker	Colaptes auratus
Rock Pigeon	Columba livia
Eastern Wood-Pewee - Special Concern	***Contopus virens***
American Crow	Corvus brachyrhynchos
Blue Jay	Cyanocitta cristata
Pileated Woodpecker	Dryocopus pileatus
Gray Catbird	Dumetella carolinensis
Alder Flycatcher	Empidonax alnorum
Least Flycatcher	Empidonax minimus
Willow Flycatcher	Empidonax traillii
Wilson's Snipe	Gallinago delicata
Common Yellowthroat	Geothlypis trichas
House Finch	Haemorhous mexicanus

Barn Swallow - Threatened (Foraging Only)	***Hirundo rustica***
Baltimore Oriole	Icterus galbula
Dark-eyed Junco	Junco hyemalis
Ring-billed Gull	Larus delawarensis
Wild Turkey	Meleagris gallopavo
Swamp Sparrow	Melospiza georgiana
Song Sparrow	Melospiza melodia
Black-and-white Warbler	Mniotilta varia
Great Crested Flycatcher	Myiarchus crinitus
Nashville Warbler	Oreothlypis ruficapilla
House Sparrow	Passer domesticus
Savannah Sparrow	Passerculus sandwichensis
Indigo Bunting	Passerina cyanea
Rose-breasted Grosbeak	Pheucticus ludovicianus
Downy Woodpecker	Picoides pubescens
Hairy Woodpecker	Picoides villosus
Black-capped Chickadee	Poecile atricapilla
Common Grackle	Quiscalus quiscula
Eastern Phoebe	Sayornis phoebe
American Woodcock	Scolopax minor
Ovenbird	Seiurus aurocapilla
Yellow-rumped Warbler	Setophaga coronata
Chestnut-sided Warbler	Setophaga pensylvanica
Yellow Warbler	Setophaga petechia
American Redstart	Setophaga ruticilla
Red-breasted Nuthatch	Sitta canadensis
White-breasted Nuthatch	Sitta carolinensis
Yellow-bellied Sapsucker	Sphyrapicus varius
American Goldfinch	Spinus tristis

American Tree Sparrow	Spizella arborea
Chipping Sparrow	Spizella passerina
Field Sparrow	Spizella pusilla
European Starling	Sturnus vulgaris
Tree Swallow	Tachycineta bicolor
Brown Thrasher	Toxostoma rufum
Winter Wren	Troglodytes troglodytes
American Robin	Turdus migratorius
Eastern Kingbird	Tyrannus tyrannus
Red-eyed Vireo	Vireo olivaceus
Mourning Dove	Zenaida macroura
White-throated Sparrow	Zonotrichia albicollis
White-crowned Sparrow	Zonotrichia leucophrys

TABLE C: OTHER WILDLIFE	
Common Name	**Scientific Name**
Coyote	Canis latrans
North American Beaver	Castor canadensis
Common Porcupine	Erethizon dorsatum
Groundhog	Marmota monax
White Tailed Deer	Odocoileus virginianus
Common Raccoon	Procyon lotor
Eastern Grey Squirrel	Sciurus carolinensis
Red Squirrel	Sciurus vulgaris
Eastern Cottontail	Sylvilagus floridanus
Eastern Chipmunk	Tamias striatus
American Toad	Anaxyrus americanus
Grey Tree Frog	Hyla versicolor
Green Frog	Lithobates clamitans
Northern Leopard Frog	Lithobates pipiens
Spring Peeper	Pseudacris crucifer
Snapping Turtle - Special Concern	***Chelydra serpentina***
Blanding's Turtle - Threatened	***Emydoidea blandingii***
Common Garter Snake	Thamnophis sirtalis

APPENDIX C

Headwaters Drainage Assessment (Muncaster Environmental Planning 2015)

McKINLEY ENVIRONMENTAL SOLUTIONS
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Muncaster
Environmental
Planning Inc.

October 15, 2015

Mr. Murray Chown
Senior Planner
NOVATECH
Suite 200, 240 Michael Cowpland Drive
Kanata, Ontario
K2M 1P6

Dear Murray:

RE: Kanata North Urban Expansion Area
Headwaters Assessment

Attached is our headwaters assessment for the channels within and in the vicinity of Woodlot S20 in the east portion of the Kanata North Urban Expansion Area.

As shown in Table 9 of the report the conclusions of the headwaters assessment are based on four evaluation criteria: hydrology, riparian conditions, fish and fish Habitat and terrestrial habitat. The channels investigated yielded a very limited fish population in one area of one of the channels and no fish in the other two channels. The hydrology component was scored as contributing for two of the channels and limited for the third channel. The scores for the riparian and terrestrial habitat criteria were the highest due to the forested swamp in Woodlot S20 and presence of amphibians.

The hydrology and fish habitat functions of these man-made channels are marginal at best. Mitigation area requirements for these channels should not be comparable to off-setting mitigation for removal of channels that provide higher ecological functions such as fish habitat and with more significant hydrology characteristics. Off-setting mitigation could be provided in the vicinity of the stormwater management pond to the west of March Valley Road and the realignment of Shirley's Brook further east of March Valley Road.

Thank you for the opportunity to complete this work and please call if you have any questions on the attached report.

Yours Sincerely,
MUNCASTER ENVIRONMENTAL PLANNING INC.

Bernie Muncaster, M.Sc.
Principal

491 Buchanan Crescent, Ottawa, ON K1J 7V2
Tel (613) 748-3753; Fax (613) 748-6376

Kanata North

Headwaters Report

Prepared for:
Novatech Engineering Consultants Ltd.
240 Michael Cowpland Drive, Suite 200
Ottawa, ON, K2M 1P6

Prepared by:
Bowfin Environmental Consulting
168 Montreal Road
Cornwall, ON K6H 1B3

And

Muncaster Environmental Planning Inc.
491 Buchanan Crescent
Ottawa ON, K1J 7V2

September 2015

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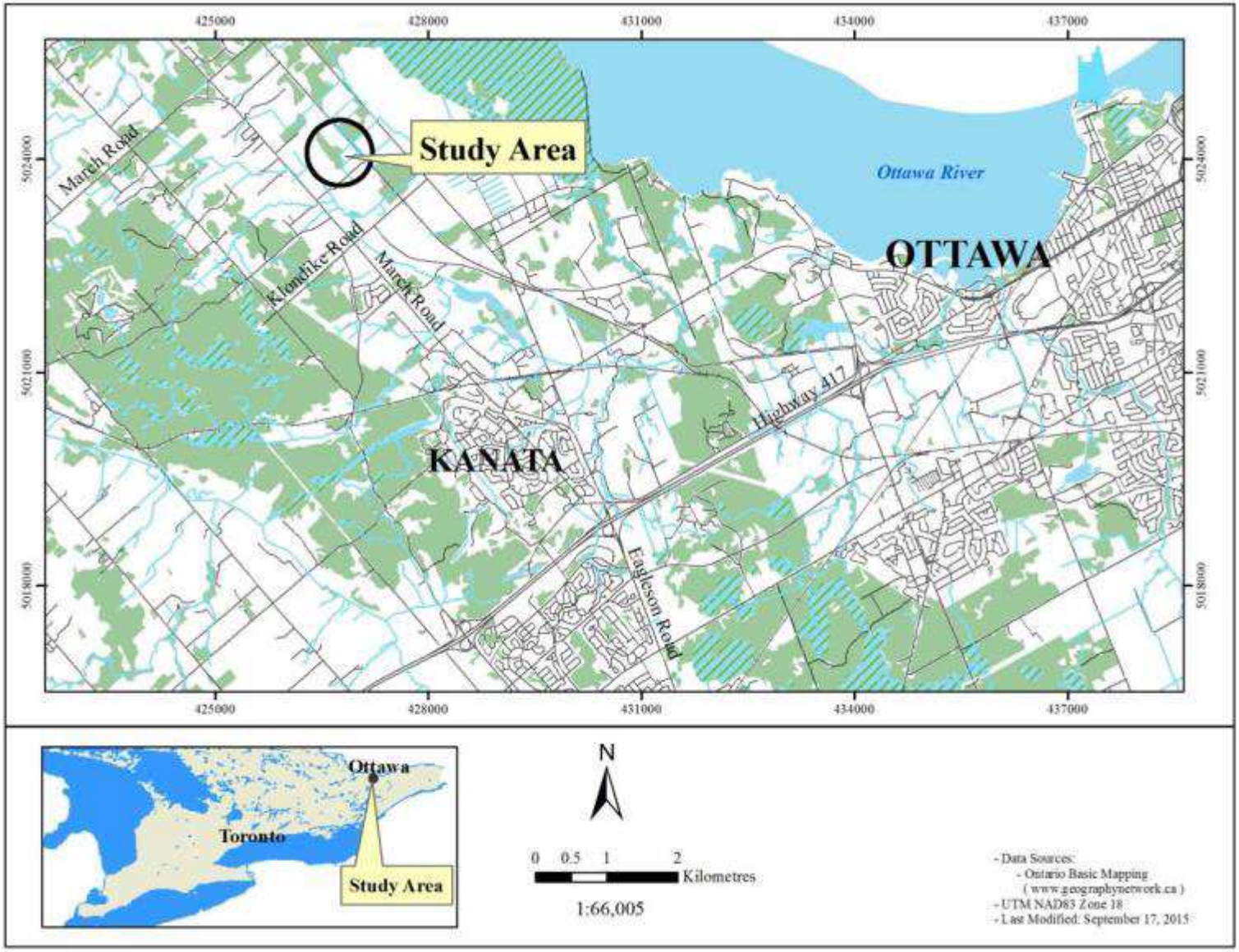
1.0 INTRODUCTION

Muncaster Environmental Planning Inc. (MEP) and Bowfin Environmental Consulting (Bowfin) have been retained by Novatech Engineering Consultants Ltd., on behalf of the Kanata North Landowner's Group and in support of the Kanata North Community Design Plan to complete an assessment of the headwater features associated with the headwater features in Woodlot S20 between March Road and the former railway line to the east. The study area is within Lot 12 and 13, Concession 4, Geographic Township of March, City of Ottawa and forms part of the Kanata North Community Design Plan. This report provides a summary of the fisheries habitat and communities findings along with an evaluation of the headwaters as per the *Evaluation, Classification and Management of Headwater Drainage Features Guidelines* created by Credit Valley Conservation and Toronto Region Conservation (Approved July 2013, Finalized January 2014).

Figure 1 Location of Study Area



2.0 METHODOLOGY

2.1 Headwater Drainage Features

The headwater drainage features within the study area were assessed based on the *Evaluation, Classification and Management of Headwater Drainage Features: Interim Guidelines* (here after referred to as the Guidelines) (prepared by Credit Valley Conservation Authority and Toronto and Region Conservation, approved July 2013, finalized January 2014). The Guideline is divided into three parts. Part 1 is the Evaluation and discusses various suggested study designs/methods. Part 2 determines the appropriate Classification following the outcome of Part 1. Finally, Part 3 outlines the Management Recommendations. In addition to this guideline, a collection of background review, fish habitat and community assessments and amphibian surveys were completed. Incidental observations of wildlife/plant species using the features were noted (Appendix A).

2.1.1 Review of Background Information

The review of background information was conducted in order to augment the data collected during the site visit. Background information regarding fish species was obtained by reviewing Distribution of Fish Species at Risk maps published by Mississippi Valley Conservation Authority (MVCA), a search of the Natural Heritage Information Centre (NHIC) databases, and a search of the Land Information Ontario databases.

2.1.2 Habitat Description

The fish habitat features within the study area was described based on the MTO *Environmental Guide for Fish and Fish Habitat October 2006* and the *Ontario Stream Assessment Protocol*. Information on the channel morphology was collected (channel width, wetted width, bankfull and wetted depths, cover type and abundance, and substrate type). The location of specific features mentioned in the text is shown on Figure 2.

2.1.3 Fish Community Sampling

Fish community sampling was performed to document the use. The community was sampled utilizing backpack electrofishing. Areas that were too shallow for electrofishing were dip netted.

2.1.4 Amphibian Surveys

The *Environment Canada Marsh Monitoring Program* (MMP) guide was followed as described below:

- The surveys were completed twice during the spring and early summer.

Survey Number	MMP Estimated Survey Period	MMP Temperature Criteria (°C)	Survey Date	Minimum Temperature (°C)
1	April 15-30th	>5	n/a	n/a
2	May 15-30th	>10	May 25	14.8
3	June 15-30	>17	June 22	14.5

- Observations begin 30 minutes after sunset and end before midnight;
- Each station is surveyed for 3 minutes during which time the species and the calling code are recorded for each of the following distances: 0-50m, 50-100m, and >100m. The calling codes are recorded as one of:
    - Code 1: Calls not simultaneous, number of individuals can be accurately counted
    - Code 2: Some calls simultaneous, number of individuals can be reliably estimated
    - Code 3: Full chorus, calls continuous and overlapping, number of individuals cannot be reliably estimated
- Surveys are only conducted if the wind strength was Code 0, 1, 2 or 3 on the Beaufort Wind Scale.
- Amphibian survey stations should be separated by at least 500 m.

In addition to the point counts a walk around the areas surrounding the features was completed to confirm presence/absence within the subject lands.

3.0 RESULTS

3.1 Review of Background Information

The NHIC databases, Land Information Ontario, OMNRF, and MVCA indicate that there are two fish species at risk within a 10 km radius of the study area (American Eel, and Lake Sturgeon). Both these species are located approximately 2 km away from the study area in Shirley's Bay on the Ottawa River. American Eel had also been documented in Shirley's Brook (LIO).

3.2 Site Investigations

3.2.1 Summary of Visits and Sampling Site Locations

Six visits were completed between June 23, 2014 and July 27, 2015. Environmental conditions for each visit are described in Table 1 below.

Information on the aquatic habitats was collected during multiple visits in particular on June 23, 2014, May 21st, June 2nd and July 27th, 2015. Additional notes were collected on the habitats during other visits and were included were applicable. The fish community was sampled using dip netting and/or backpack electrofishing. Sampling took place on June 23, 2014, and May 25, 2015 visit, no additional sampling was conducted during the summer as the sites were dry. The electrofishing settings utilized were 200-250 volts and 1.0-1.2 amps. Figure 2 provides the locations of the sampling stations and features described below.

Table 1 Summary of Dates, Times of Site Investigations

Date	Time (h)	Staff	Air Temperature (Min-Max) °C	Weather	Purpose
June 23, 2014	1045-1430	S .St. Pierre	26.0-29.0 ()	30% cloud cover, light breeze changing to 50% cloud cover, light breeze	- Fish Habitat Assessment
May 21, 2015	0930-1215	S. St. Pierre C. Fontaine	14.0-18.0 (6.2-20.6)	20% cloud cover, gentle breeze changing to 10% cloud cover, gentle breeze	- Headwater Assessment
May 25, 2015	2015-2230	S. St. Pierre C. Fontaine	17.0-19.0 (14.2-18.9)	100% cloud cover, light breeze changing to 100% cloud cover, gentle breeze	- Fish Community Sampling - Amphibian Monitoring
June 2, 2015	1145-1300	S. St. Pierre	17.0 (5.8-16.5)	100% cloud cover, light air, rain	- Headwater Assessment
June 22, 2015	2115-2200	S. St. Pierre C. Fontaine	22.0 (15.4-27.8)	Overcast, light breeze	- Amphibian Monitoring
July 27, 2015	0930-1030	S.St.Pierre	27.0 (18.3-31.8)	20% cloud cover, light breeze changing to 40% cloud cover, gentle breeze	- Headwater Assessment

S. St. Pierre – Shaun St. Pierre – B. Sc. Biology and Fisheries and Wildlife Technologist
C. Fontaine - Cody Fontaine - Fisheries and Wildlife Technologist

*Min-Max Temp Taken From: Environment Canada. National Climate Data and Information Archive. Ottawa International Airport, Ontario. Available http://climate.weatheroffice.gc.ca/ [July 31, 2105]

3.2.2 Habitat and Fish Community Descriptions

Tables 2 provide a summary of the water temperatures and other parameters collected at the stations during 2014 and 2015. The water temperatures varied between 14.1-29.5° C, with air temperatures varying between 17.0-29.0° C.

Figure 2 Location of Headwater Features and Stations

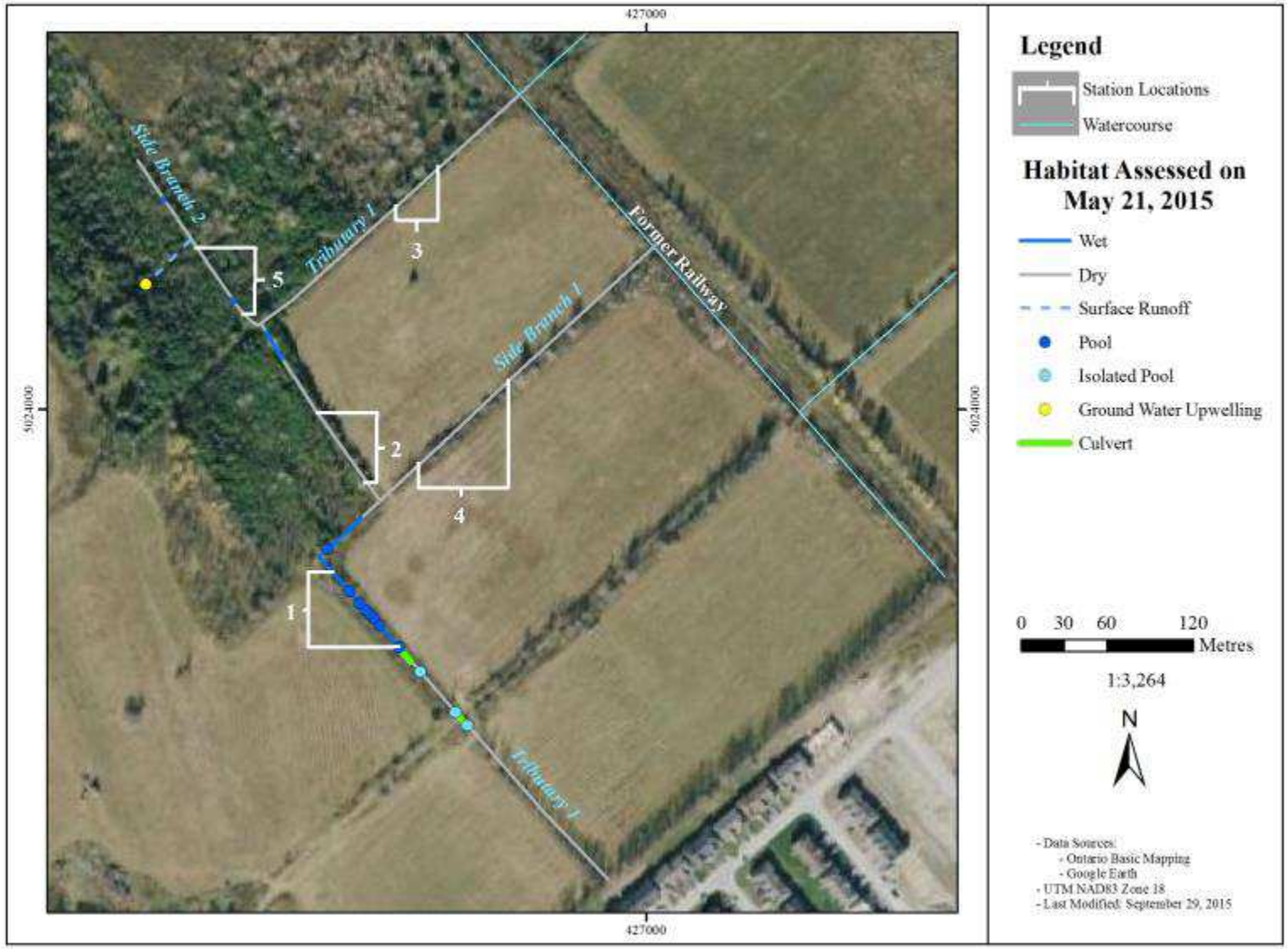


Table 2 Features and sampling parameters from Tributary 1 and side branches (Figure 2)

Station No.	Date	Time	Air Temp (°C)	Water Temp (°C)	pH	TDS (ppm)	Conductivity (µ)	Ave. Depth (cm)	Ave. Wetted Width (m)	Ave. Channel Width (m)
Tributary 1										
1	June 23, 2014	1306	29.0	29.5	8.74	159	340	7	1.2	2.1
	May 21, 2015	1008	18.0	14.1	8.25	271	547	7	1.0	
	May 25, 2015	2045	18.0	16.8	7.65	302	433	14	1.5	
	June 2, 2015	1216	17.0	17.6	7.58	461	670	9	1.7	
	July 27, 2015	DRY								
2	June 23, 2014	DRY								1.6
	May 21, 2015	DRY								
	June 2, 2015	DRY								
	July 27, 2015	DRY								
3	June 23, 2014	DRY								1.6
	May 21, 2015	DRY								
	June 2, 2015	DRY								
	July 27, 2015	DRY								

Station No.	Date	Time	Air Temp (°C)	Water Temp (°C)	pH	TDS (ppm)	Conductivity (µ)	Ave. Depth (cm)	Ave. Wetted Width (m)	Ave. Channel Width (m)
Side Branch 1										
4	June 23, 2014				DRY					
	May 21, 2015				DRY					1.6
	June 2, 2015				DRY					
	July 27, 2015				DRY					
Side Branch 2										
5	May 21, 2015				TOO SHALLOW			2	1.1	
	June 2, 2015	1238	17.0	14.1	8.16	261	376	1	0.5	2.0
	July 27, 2015				DRY					

Tributary 1 (Unnamed)

Of the watercourses within the study area, this is the longest. It begins on the west side travelling through the windrow between crop fields and continues to the east and north along the edge of crop fields with thickets and forests on the other side. The total length is approximately 1.2 km. The two other watercourses surveyed (side branches 1 and 2) are both tributaries to this channel. Tributary 1 was entrenched with a straight pattern and is a man-made drainage ditch.

During the primary habitat visit completed on May 21, 2015, the tributary alternated between wet and dry sections (figure 2). This poor connectivity and the seasonality of the system, which would restrict movement outside of the spring, were the only barriers to fish movement.

The channel was described and sampled along three stations (Stations 1, 2 and 3).

Station 1

The upstream end of Station 1 was located approximately 200 m downstream of the start (upstream end) of the tributary. The station length was 68 m in length. This station was originally described in 2014 and the information collected at that time matches the habitat data from 2015. The following information is summarized from the May 21, 2015 visit. The wetted width and depths recorded during the other visits are provided in Table 2. The average channel and wetted widths were 2.1 m and 1.0 m respectively. The average bankfull depth was approximately 25 cm and the average water depth was approximately 7 cm (range 1-34 cm). The habitat type consisted of glide and deep pool morphological units. The substrate consisted of fines. The in-water cover consisted of the overhanging vegetation, aquatic vegetation (algae, pondweed species, lakebank sedge, and reed canary grass), occasional piece of large woody debris, and pool habitat. The maximum pool depth ranged from 15 to 34 cm. This station had moderate canopy cover. Exposed soils and some undercutting on the banks were noted throughout the station.

The banks were fully vegetated with herbaceous species and woody species. The most common species were: reed canary grass, purple loosestrife, common sow-thistle, goldenrod species, poison-ivy, red-osier dogwood, hawthorn species, Tartarian honeysuckle, common buckthorn, green ash, black ash, American elm, Manitoba maple, and white cedar. These provided little in the way of canopy cover.

This site was sampled using backpack electrofishing and dip netting twice; once on June 23, 2014 and again on May 25th, 2015 (Table 3). Fish were only seen and/or captured during the 2014 visit. A total of eight brook sticklebacks were captured.

Table 3 Summary of Flow Data and Fish Community Sampling

Date	Wetted Width (m)	Average Depth (range) (cm)	Effort	Results (species, numbers and fork lengths)
June 23, 2014	1.2	7 (1-25)	3 s/m^2 20 dips (too shallow to electrofish)	Brook sticklebacks (8 individuals; 15-62 mm)
May 21, 2015	1.0	7 (1-34)	None	n/a
May 25, 2015	1.5	14 (3-24)	7 s/m^2	0
June 2, 2015	1.7	9 (6-22)	None	n/a
July 27, 2015	dry			

Photo 1 Looking downstream from the upstream end of Station 1 (June 23, 2014)

Photo 2 Looking downstream from the upstream end of Station 1 (May 21, 2015)

Photo 3 Looking downstream from the upstream end of Station 1 (June 2, 2015)

Photo 4 Looking downstream from the upstream end of Station 1 (July 27, 2015)

Station 2

The upstream end of Station 2 was located approximately 85 m downstream of station 1 and was 60 m in length. This station was originally described in 2014 and the information collected at that time matches the habitat data from 2015. This entire station was dry during all visits. The average channel width and bankfull depth were 1.6 m and 21 cm respectively. The substrate consisted of fines. There was no in-stream cover. This station had full canopy cover. No signs of erosion were noted at this station.

The banks were fully vegetated with herbaceous species and woody species. The most common species were: sensitive fern, purple loosestrife, poison-ivy, Virginia creeper, meadowsweet species, common buckthorn, American elm, trembling aspen, white cedar, and green ash.

No sampling was conducted at this station during 2014 or 2015 due to lack of water.

Photo 5 Looking downstream from the upstream end of Station 2 (June 23, 2014)

Photo 6 Looking downstream from the upstream end of Station 2 (May 21, 2015)

Photo 7 Looking downstream from the upstream end of Station 2 (June 2, 2015)

Photo 8 Looking downstream from the upstream end of Station 2 (July 27, 2015)

Station 3

The upstream end of Station 3 was located approximately 200 m downstream of Station 2 and was 40 m in length. This station was originally described in 2014 and the information collected at that time matches the habitat data from 2015. This entire station was dry during all visits.

The average channel width and bankfull depth were 1.6 m and 28 cm respectively. The substrate consisted of fines. Some woody debris, that would provide cover during high flows, was present. This station had full canopy cover. The banks had no signs of erosion but exposed soil was noted

The banks were fully vegetated with herbaceous species and woody species. The most common species were: field horsetail, Virginia creeper, poison-ivy, common buckthorn, staghorn sumac, speckled alder, white cedar, and green ash.

No sampling was conducted at this station during 2014 or 2015 due to lack of water.

Photo 9 Looking downstream from the upstream end of Station 3 (June 23, 2014)

Photo 10 Looking downstream from the upstream end of Station 3 (May 21, 2015)

Photo 11 Looking downstream from the upstream end of Station 3 (June 2, 2015)

Photo 12 Looking downstream from the upstream end of Station 3 (July 27, 2015)

Side Branch 1 (Unnamed)

A short, 0.3 km long, unnamed drain reaches Tributary 1 approximately 345 m downstream of its headwaters. This smaller drain travels along the edge of the windrow between two crop fields. This watercourse flows in a southwest direction. It was typical of agricultural drains in that it was entrenched with a straight pattern. This side branch was dry during all visits (figure 2). The only barrier to fish movement was the seasonality of the system which would restrict movement to the spring freshet. This drain was described at one station (Station 4).

Station 4

The downstream end of Station 4 was located approximately 36 m upstream of the confluence with Tributary 1. The station length was 80 m in length. This station was originally described in 2014 and the information collected at that time matches the habitat data from 2015. This entire station was dry during all visits. The average channel width and bankfull depth were 1.6 m and 30 cm respectively. The substrate consisted of fines. There was no in-stream cover. This station had poor canopy cover (windrow was providing cover only on the north bank). Exposed soil was noted on the banks.

The banks were moderately vegetated with herbaceous species and woody species. The most common species were: Virginia creeper, goldenrod, sensitive fern, reed canary grass, purple loosestrife, cow vetch, slender willow, choke cherry, glossy buckthorn, red-osier dogwood, green ash, American elm, and Manitoba maple.

No sampling was conducted at this station during 2014 or 2015 due to lack of water.

Photo 13 Looking upstream from the downstream end of Station 4 (June 23, 2014)

Photo 14 Looking upstream from the downstream end of Station 4 (May 21, 2015)

Photo 15 Looking upstream from the downstream end of Station 4 (June 2, 2015)

Photo 16 Looking upstream from the downstream end of Station 4 (July 27, 2015)

Side Branch 2 (Unnamed)

The second (side branch 2) was located 510 m downstream from the headwaters of Tributary 1. This branch travels through a coniferous forest and its total length was 150 m. It flows in a southeast direction. This channel was not as well defined as the other drains however it was straight and appeared to be man-made.

This site was not visited in 2014. It contained some water during the May and June 2015 visits but was dry during the July visit (Figure 2). The only barrier to fish movement was the seasonality of the system which would restrict movement outside of the spring. One station was established on side branch 2 (Station 5).

As noted on Figure 2, an upwelling was noted in the adjacent lands to Station 5. The upwelling originated within ruts along an old abandoned access road. During the spring the upwelling created a pool and some flowing water which travelled down the ruts and reached Side Branch 2. Even during the spring, there was never sufficient water being contributed by the upwelling to create flow within Side Branch 2. Side Branch 2 only ever had standing water. The upwelling was visible during all visits but it only created saturated soil conditions during the summer. The water temperature of the upwelling was 9°C. These observations are consistent with those by Paterson Group (2015) in their Shallow Bedrock Hydrogeological Assessment (August 7th, 2015). Paterson Group (2015) noted that at several locations, groundwater elevations were within the elevation of the overburden layers, or above ground surface. This suggests that the upper fractured bedrock layer is fully saturated, and that overburden soils are acting as a confining layer (Paterson Group, 2015). The presence of overburden soils of lower hydraulic conductivity overlying the bedrock aquifer units are considered to limit the potential for significant groundwater discharge in these areas (Paterson Group, 2015). Paterson Group (2015) concluded that the groundwater recharge and discharge is occurring on a localized scale within the shallow silty sand soils, while underlying silty clay soils and the limited extent of silty sand soils preclude any significant discharge or recharge from the underlying bedrock aquifer. Paterson Group (2015) also noted that Side Branch 2 (identified by Paterson Group (2015) as the drainage channel in Woodlot S20) is negatively graded in areas, allowing water to pond.

Station 5

The downstream end of Station 5 was located approximately 90 m from station 2. The station length was 56 m. This description is a summary of the May 21, 2015 visit. It was noted that even at this time portions of this drain were dry. The average channel and wetted widths were 2.0 m and 1.1 m respectively. The average bankfull depth was approximately 13 cm and the average water depth was approximately 2 cm (range 1-3 cm). The substrate consisted of fines. There was no in-stream cover. This station had full canopy cover. There were no signs of erosion.

The banks were moderately vegetated with herbaceous species and woody species. The most common species were: sensitive fern, field horsetail, grass species, and white cedar.

No sampling was conducted at this station due to lack of water.

Table 4 Summary of Flow Data and Fish Community Sampling

Date	Wetted Width (m)	Average Depth (range) (cm)	Effort	Results (species, numbers and fork lengths)
May 21, 2015	1.1	2 (1-3)	None	n/a
June 2, 2015	0.5	1 (0-1)	None	n/a
July 27, 2015	dry			

Photo 17 Looking upstream from the downstream end of Station 5 (May 21, 2015)

Photo 18 Looking upstream from the downstream end of Station 5 (June 2, 2015)

Photo 19 Looking upstream from the downstream end of Station 5 (July 27, 2015)

4.0 Headwater Drainage Features Assessment

4.1 Classification

This classification follows the four step process of the Headwater Guideline using the information collected from the portion of the tributaries in the subject lands. The four steps are: hydrology classification, riparian classification, fish and fish habitat classification and terrestrial classification.

4.1.1 Step 1: Hydrology Classification

In step 1 the flow is classified based on the amount recorded during the three visits. These are summarized in Table 5 (as per OSAP S4.M10).

Note that there is no appropriate feature type code for these systems with the exception of a part of Side Branch 2 which travels through what is identified as a coniferous forested swamp and would be considered as a (6) wetland Feature Type. All three of these features are really constructed watercourses. A review of the geoOttawa mapping indicates that all were presence since before 1965 and that the fields on both sides of Tributary 1 and Side Branch 1 were cropped since prior to 1965. The land to the northwest of Side Branch 2 was also cropped until sometime between 1971 and 1991. The field northwest of Side Branch 2 was abandoned sometime after 1971 and had become vegetated with some small shrubs by 1991.

There are three possible codes for the Feature Types:

- (2) Channelized
    - This code requires there to have been a natural channel that shows signs of channelization. There is no evidence of a channel being present.
- (7) Swale
    - This definition fits the best with the exception of the ill-defined banks. Since it had been dug down the banks are well defined. However the description of a system that carries water flow during rainstorms or snowmelt matches. Note that this system only would carry water during snow melt (no flowing water during rainstorms – June 2, 2015 visit was completed after a rain event).
- (8) Roadside Ditch
    - This definition fits with the constructed nature of the features however there is no roadway.

No spring runoff visit was completed by Bowfin. Information provided by others (MEP and Parish Geomorphic) indicates that there was flow in the early spring on Tributary 1 near March Valley Road in 2013. Parish Geomorphic classed this as surface flow minimal. This low flow continued to approximately 100 m upstream of the railroad after which there was only standing

water. No information is available for spring freshet flows in either side branch. However, Parish Geomorphic staff walked Tributary 1 and did not notice flow entering from either side branch suggesting that there was little to no flow in these.

The guidelines use a table to direct the assessor to one of five categories:

A. Important – Perennial. These typically have water year round. Water should be flowing but may have standing or subsurface for some segments.
B. Valued – Intermittent. Flowing water are present until late spring; they are dry or surface damp by July. The benthic macroinvertebrates (aquatic insects) will include damselfly nymphs, clams and scuds but no caddisfly larvae, Mayfly nymphs, stonefly nymphs or black flies in the summer.
C. Contributing – Ephemeral. These systems have flow or water storage functions during and for a short time after spring freshet and also after large rain events. They have aquatic worms and leaches but not aquatic macroinvertebrates.
D. Recharge – Dry or Standing Water. Never have any flowing water. The soils are coarse textured allowing for infiltration.
E. Limited – Dry or Standing Water. Never have any flowing water. The soils are fine and do not permit infiltration.

Based on the above and the Table 4 in the guidelines Tributary 1 would be considered either Valued or Contributing. As described above, Valued Functions would flow until late spring. This was not the case. The definition of Contributing is a better fit to the field observations.

Side Branch 1 is a very short (<0.3km) channel that has a little drainage area. The confluence with Tributary 1 is easily observed and had there been flow during the freshet in 2013 it would have been noted by Parish. No flow was present during the 2015 site visits even after the rain event in early June. This leaves two options: Recharge or Limited. A review of the soil map for the area indicates that Jockvale and St. Thomas soils are present. These are described as being poorly to very poorly drained preventing the area from meeting the Recharge Function description. The field observations and soil types match the description of Limited Functions (Dry or Standing Water).

Following Table 4 of the guidelines, Side Branch 2 would be considered as providing a Valued or Contributing Function because of the presence of the associated coniferous forested swamp. Again, it is recognized that no spring freshet data is available. During the 2015 observations, only standing water was present even after large rain events. The confluence with Tributary 1 is not as easily found as that of Side Branch 1. As such it is assumed that flow could be possible during the freshet. As such this channel may provide Contributing Function.

Table 5 Hydrology classification features using data from OSAP S4.M10.

Tributary ID	Definitions of Flow Influence	Flow Conditions	Types of Headwater Drainage Features	Hydrology Classification
1	Spring Freshet or rainfall events	Surface Flow Minimal (assumed) (4)	Constructed agricultural drain	Contributing
	Late April-May	Standing water (2)		
	July-August	N/A (dry)		
Side Branch 1	Spring Freshet or rainfall events	N/A (dry)	Constructed agricultural drain	Limited
	Late April-May			
	July-August			
Side Branch 2	Spring Freshet or rainfall events	Standing water (2)	Abandoned agricultural drain in an area that is naturalizing. Coniferous swamp habitat is associated with portions of this channel	Contributing
	Late April-May			
	July-August	N/A (dry)		

The amount of rainfall recorded in the seven days preceding each station visit is summarized in Table 6 to provide context to the water depths in Table 2.

Table 6 Summary of Rainfall for the 7 Days Preceding the Field Surveys

Dates	Total Rainfall (mm)
June 16, 2014 – June 22, 2014	0.6
May 14, 2015 - May 20, 2015	2.0
May 18, 2015 - May 24, 2015	1.6
May 26, 2015 - June 1, 2015	20.4*
July 20, 2015 - July 26, 2015	6.6

Total Rainfall taken from: Environment Canada. 2015. National Climate Data and Information Archive – Ottawa INTL. On-line (http://climate.weatheroffice.gc.ca) accessed September 17, 2015.

4.1.2 Step 2: Riparian Classification

Terrestrial and wetland habitats adjacent to headwater feature can influence the ecological value of the headwater feature. As such, the surrounding habitat is also included in the evaluation criteria. This habitat can be assessed based on the *Ecological Land Classification* (ELC) or *Ontario Wetland Evaluation System* (OWES), as appropriate, if they have been completed as part of the Environmental Impact Study/ Natural Heritage Evaluation or through the use of the OSAP S4.M10. When the value of the land type differs from one bank to the other, the highest functioning habitat is used.

The adjacent vegetation classifications as completed by MEP in the Natural Environment Features Existing Conditions Report for the Kanata North Urban Expansion Area (Revised February, 2014) identified the adjacent lands as: Fresh-Moist Ash-Poplar Deciduous Forest, Fresh-Moist Poplar Deciduous Forest, Fresh-Moist White Cedar Coniferous Forest, White Cedar Coniferous Swamp, Cultural Woodland, Cultural Thicket, and Cleared Areas.

As defined in the guidelines on this criterion Tributary 1 and Side Branch 2 are listed as having Important Function due to the presence of forest and swamp habitat. This habitat is found along only one bank for Tributary 1 but is present on both banks for Side Branch 2. Side Branch 1 is determined to be Limited Function due to the cropped land (Table 7).

Table 7 Riparian Classification

Tributary	Riparian Classification	Comments
1	Important Functions	Within the subject land the tributary flows alongside a coniferous forest, coniferous swamp, deciduous forest and cropped land. The dominate being cropped land.
Side Branch 1	Limited Functions	Within the subject land the tributary flows along the edge of a very narrow windrow and cropped land. The dominate being cropped land.
Side Branch 2	Important Functions	Within the subject land the tributary flows within a coniferous forest, and coniferous swamp.

4.1.3 Step 3: Fish and Fish Habitat Classification

The guidelines classify fish habitat as either:

A. Important – Any fish species present in spring and mid-summer, suitable spawning habitat for any fish, the presence of species at risk (SAR) at any time, or critical habitat to downstream SAR

B. Valued – fish found only in spring or the habitat of SAR (SAR habitat may be for: feeding, cover, refuge, migration or contributing habitat)
C. Contributing – Allochthonous (i.e. insects, materials) transport through the feature to downstream fish habitat.

Fish were captured during spring 2014 in a refuge pool from one station along Tributary 1. No fish were captured along any other stations and no fish were seen or captured from Tributary 1 during 2015. The only species captured was brook stickleback, a common warm to cool water fish species. The species at risk identified for the general area (American eel and lake sturgeon) do not frequent farm ditches such as these. While fish were present during 2014 in the refuge pool they were limited in number and diversity and likely did not survive.

Tributary 1 would provide refuge habitat for fish during years with high snow melt/spring rains. During these years it would be considered a Valued Function (as per the guidelines). On years when flows are lower it would provide Contributing Functions (a lower value of fish habitat than one with Valued Function).

The other two channels (side branch 1 and 2) would at best provide Contributing Functions. However, the lack of flow limits the ability of any allochthonous transport to downstream fish bearing waters to only the brief period associated with spring freshet (flow is required to push the material/nutrients downstream). The nearest fish bearing downstream habitat is Shirley's Brook situated 0.5 km downstream.

4.1.4 Step 4: Terrestrial Habitat Classification

Step 4 of the guidelines classifies the value of the headwater feature as it relates primarily to amphibian breeding habitat and its ability to provide movement corridors. It is assessed through the use of both the OSAP S4.M10 and Marsh Monitoring Protocol. The feature must meet both of these protocols for each class. Only those features with both wetland habitat (Feature Type Code 6 - wetland) and amphibians calling can be deemed to provide Important Function.

Amphibians were heard calling on all three headwater feature however the best fit feature type Code is a 7 (swale) for Tributaries 1 and Side Branch 1. Side Branch 2 has both swale and wetland feature types associated with it. As such the terrestrial habitat would be classed as Important for Side Branch 2 and Limited for the other two.

Based on the guidelines the Contributing Function is to be listed at a landscape scale and using guidelines from the EIS. This was completed during the writing of the *Natural Environment Features Existing Conditions Report for the Kanata North Urban Expansion Area report* prepared by MEP and in discussions with the Ministry of Natural Resources and Forestry (MNRF). It has been determined that this area does not provide a movement corridor.

Table 8 Terrestrial Habitat Classification

Tributary	OSAP S4.M10 Feature Type Code	Marsh Monitoring Amphibian Results	Terrestrial Habitat Classification
Tributary 1	Constructed agricultural drain (codes 2, or 7 may fit)	Visit 1 – n/a Visit 2 - Spring Peepers, Tetraploid Gray Treefrogs, and American Toads Visit 3 - Tetraploid Gray Treefrogs	Limited
Side Branch 1	Constructed agricultural drain (codes 2, or 7 may fit)	Visit 1 – n/a Visit 2 – American toads Visit 3 – no calls	Limited
Side Branch 2	Abandoned agricultural drain in an area that is naturalizing (codes 2, or 7 may fit). Wetland habitat is associated with portions of this channel (6 - wetland)	Visit 1 – n/a Visit 2 – Spring peepers Visit 3 – no calls	Important

4.2 Part 3 – Management Recommendations

The options for management recommendations are grouped into six categories: protection, conservation, mitigation, maintain recharge, maintain/ replicate terrestrial linkage, and no management required. Utilising the guideline and the data collected at each feature the management recommendations are: Conservation for Tributary 1 and Side Branch 2 and No Management Required for Side Branch 2 (Table 9).

Conservation signifies that the feature can be left in place or relocated. Relocate may consist recreating the feature ensuring that a similar hydroperiod is achieved and that nearly, the same or more habitat is provided. The new habitat may be created on or off-site. For features with important riparian habitat function, the relocated feature will also include similar riparian function.

Table9 Evaluation, Classification and Management Summary and Study Conclusion

Drainage Feature Segment	Hydrology Classification	Riparian Classification	Fish and Fish Habitat Classification	Terrestrial Habitat Classification	Guideline's Management
Tributary 1	Contributing	Important	Contributing to Valued depending on spring freshet	Limited	Conservation
Side Branch 1	Limited	Limited	Contributing	Limited	No Management Required
Side Branch 2	Contributing	Important	Contributing	Important	Conservation

4.3 Next Steps

As discussed above, Side Branch 1 has No Management Required and can be removed. For Tributary 1 and Side Branch 2, a calculation of the available habitat (channel width x length) and the riparian habitat will be required. Based on these calculations new habitat will be created on-site or offsite. For example the habitat creation may be associate with the stormwater management ponds west of March Valley Road or the proposed re-alignment of Shirley's Brook further east of March Valley Road. Engineering solutions such as directing clean flow from the roofs or basements to the newly created habitat will be investigated.

Reliance Clause

This report has been prepared for Novatech Engineering Consultants Ltd., on behalf of the Kanata North Landowner's Group and in support of the Kanata North Community Design Plan. It is hereby acknowledged that Metcalfe Realty Company Limited, J. G. Rivard Limited and 8409765 Canada Inc. (Valecraft Homes) can rely upon and utilize this report for the purpose of obtaining approval of the community design plan and for their own use to seek development approval.

It is further acknowledged that future confirmed participating landowners within the Kanata North Landowner's Group can rely upon and utilize this report for the purpose of obtaining approval of the community design plan and for their own use to seek development approval.

Appendix A

Incidental Observations

Common Name	Scientific Name	SRank	Provincial Status (SARO)	Federal Status (SARA)	Coefficient of Conservatism
AMPHIBIANS					
American Toad	*Bufo americanus*	S5			
Tetraploid Gray Treefrog	*Hyla versicolor*	S5			
Spring Peeper	*Pseudacris crucifer*	S5			
Northern Leopard Frog	*Rana pipiens*	S5			
BIRDS					
Wild Turkey	*Meleagris gallopavo*	S5			
PLANTS					
Algae sp.	*Algae sp.*				
Sensitive Fern	*Onoclea sensibilis*	S5			4
Field Horsetail	*Equisetum arvense*	S5			0
Eastern White Cedar	*Thuja occidentalis*	S5			4
Manitoba Maple	*Acer negundo*	S5			0
Western Poison-ivy	*Rhus radicans ssp. rydbergii*	S5			0
Staghorn Sumac	*Rhus typhina*	S5			1
Goldenrod sp.	*Solidago sp.*				
Common Sow-thistle	*Sonchus oleraceus*	SNA			
Speckled Alder	*Alnus incana spp. rugosa*	S5			6
Tartarian Honeysuckle	*Lonicera tatarica*	SNA			
Red-osier Dogwood	*Cornus stolonifera*	S5			2
Purple Loosestrife	*Lythrum salicaria*	SNA			
Black Ash	*Fraxinus nigra*	S5			7
Green Ash	*Fraxinus pennsylvanica*	S5			3
Common Buckthorn	*Rhamnus cathartica*	SNA			
Glossy Buckthorn	*Rhamnus frangula*	SNA			
Hawthorn sp.	*Crataegus sp.*				
Choke Cherry	*Prunus virginiana ssp. virginiana*	S5			2
Narrow-leaved Meadowsweet	*Spiraea alba*	S5			3
Trembling Aspen	*Populus tremuloides*	S5			
American Elm	*Ulmus americana*	S5			3
Virginia Creeper	*Parthenocissus inserta*	S5			3
Lakebank Sedge	*Carex lacustris*	S5			5
Grass Family	*Poaceae*				

Common Name	Scientific Name	SRank	Provincial Status (SARO)	Federal Status (SARA)	Coefficient of Conservatism
Reed Canary Grass	*Phalaris arundinacea*	S5			0
Pondweed sp.	*Potamogeton sp.*				

Status updated: September 17, 2015

SRANK DEFINITIONS

S5 Secure, Common, widespread, and abundant in the nation or state/province.

SNA Not Applicable, A conservation status rank is not applicable because the species is not a suitable target for conservation activities.

Coefficient of conservatism ranking criteria

0 Obligate to ruderal areas.
1 Occurs more frequently in ruderal areas than natural areas.
2 Facultative to ruderal and natural areas.
3 Occurs less frequent in ruderal areas than natural areas.
4 Occurs much more frequently in natural areas than ruderal areas.
5 Obligate to natural areas (quality of area is low).
6 Weak affinity to high-quality natural areas.
7 Moderate affinity to high-quality natural areas.
8 High affinity to high-quality natural areas.
9 Very high affinity to high-quality natural areas.
10 Obligate to high-quality natural areas.

APPENDIX D

Butternut Health Assessment (Rose Fleguel 2018)

McKINLEY ENVIRONMENTAL SOLUTIONS
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Beth Henderson
200-180 Kent St.
Ottawa, ON
K1P 0B6
bhenderson@minto.com

June , 2018

RE: 936 March Rd., Kanata
BHA Report Number: 18-004
Date(s) of Butternut health assessment: May 24 and 29, June 20, 22, 25 and 30, 2018

Dear Beth,

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

Butternut is listed as an endangered species on the Species at Risk in Ontario List, and as such, is protected under the 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 MNR District Manager. Note that the MNR will not accept photocopies. The BHA Report must be submitted at least 30 days prior to registering 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 MNR may contact you for an opportunity to examine the trees.

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

Summary of changes related to Butternut:
http://www.ontario.ca/environment-and-energy/butternut-trees-your-property

MNR office locations:
http://www.mnr.gov.on.ca/en/ContactUs/2ColumnSubPage/STEL02_179002.html

If MNR chooses to examine the trees, a representative of the MNR will contact you using the information you supplied when you submitted the BHA Report. After the examination has been completed, MNR will notify you if the examination results change whether you are eligible for the regulation.

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 MNR 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 Ministry of Natural Resources (MNR) office to determine whether you will need to seek a permit. A link to the directory of MNR offices is provided in the text box on the previous page.

As a designated Butternut Health Assessor (BHA), I am providing the following Butternut Health Assessor's Report for the trees located at the above noted property, for which I completed an assessment during the site visit on the above noted date. If there are other Butternut trees at the site that may be affected by the activity and they are not identified in this report, they too must be assessed by a BHA.

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 letter and a copy of the BHA Report along with any other documentation you may receive from the MNR should an examination of the trees occur. If you have any questions, please do not hesitate to contact me or Aaron Foss, Fish & Wildlife Technical Specialist at the Kemptville District Ministry of Natural Resources office at aaron.foss@ontario.ca

Sincerely,

Rose Fleguel

Enclosures:

1. Butternut Health Assessor's (BHA) Report
2. Copied data forms – originals to MNR
3. Electronic copy of the Excel data spreadsheet (BHA Tree Analysis)

Butternut Health Assessor's Report

Rose Fleguel
405 Latourell Rd.
Mountain, ON
K0E 1S0

Beth Henderson
200-180 Kent St.
Ottawa, ON
K1P 0B6

Property description: 936 March Rd., Kanata
BHA Report Number: 18-004
Date(s) of Butternut health assessment: May 24, 29, June 20, 22, 25 and 30, 2018
Date BHA Report prepared: June 30, 2018

Map datum used: ☒ NAD83 ☐ WGS84

Total number of trees in this BHA Report:

The assessed trees were numbered using white tree marking paint or white flagging tape. The numbers on the trees correspond to the tree numbers used in this report.

This BHA Report includes the following tables:

- Table 1: Butternut trees proposed to be killed, harmed, or taken
- Table 2: Butternut trees that are **not** proposed to be killed, harmed or taken
- Table 3: Trees determined to be hybrid Butternuts
- Table 4: Summary of Assessment Results

Table 1: Butternut trees proposed to be killed, harmed, or taken

Tree #	UTM coordinates	Category[1] *(1, 2, or 3[2])*	dbh[3] (cm)	Cultivated? *(Y/N)*	Proposed to be: *(enter one: killed, harmed or taken)*	Reason tree is proposed to be killed, harmed or taken:
1	E0426657 N5023571	2	7	N	unknown	
2	E0426653 N5023556	2	22	N	unknown	
3	E0426741 N5023456	2	4	N	unknown	
4	E0426782 N5023489	2	40	N	unknown	
5	E0426786 N5023502	2	4	N	unknown	

[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] The rules in regulation under section 23.7 of O. Reg. 242/08 are not applicable to Category 3 trees.
[3] dbh: diameter at breast height, rounded to nearest cm (if tree is shorter than breast height, enter zero)

Tree #	UTM coordinates	Category[1] *(1, 2, or 3[2])*	dbh[3] (cm)	Cultivated? *(Y/N)*	Proposed to be: *(enter one: killed, harmed or taken)*	Reason tree is proposed to be killed, harmed or taken:
6	E0426729 N5023637	2	13	N	unknown	
7	E0426736 N5023642	2	10	N	unknown	
8	E0426711 N5023600	1	14			
9	E0426715 N5023595	2	16			
10	E0426686 N5023583	2	3			
11	E0426683 N5023583	1	1			
12	E0426682 N5023583	2	8			
13	E0426679 N5023584	2	11			
14	E0426672 N5023584	2	13			
15	E0426669 N5023585	2	14			
16	E0426675 N5023580	1	4			
17	E0426657 N5023574	1	1			
18	E0426577 N5023546	2	4			
19	E0426576 N5023537	2	5			
20	E0426575 N5023537	2	2			
21	E0426575 N5023537	1	2			
22	E0426565 N5023532	2	2			
23	E0426596 N5023526	2	3			
24	E0426601 N5023519	2	1			
25	E0426644 N5023491	2	1			
26	E0426632 N5023521	2	2			
27	E0426641 N5023508	2	2			
28	E0426659 N5023663	1	10			
29	E0426661 N5023663	1	11			

Tree #	UTM coordinates	Category[1] *(1, 2, or 3[2])*	dbh[3] (cm)	Cultivated? *(Y/N)*	Proposed to be: *(enter one: killed, harmed or taken)*	Reason tree is proposed to be killed, harmed or taken:
30	E0426655 N5023665	2	16			
31	E0426669 N5023647	2	3			
32	E0426667 N5023648	2	33			
33	E0426638 N5023668	2	22			
34	E0426638 N5023670	1	13			
35	E0426650 N5023667	2	6			
36	E0426636 N5023667	1	6			
37	E0426640 N5023669	1	5			
38	E0426634 N5023681	1	5			
39	E0426638 N5023682	2	3			
40	E0426635 N5023683	2	3			
41	E0426635 N5023683	2	5			
42	E0426634 N5023684	2	5			
43	E0426626 N5023680	2	13			
44	E0426623 N5023679	2	5			
45	E0426624 N5023672	2	6			
46	E0426625 N5023672	2	6			
47	E0426628 N5023676	2	5			
48	E0426621 N5023671	2	8			
49	E0426618 N5023684	2	16			
50	E0426619 N5023680	2	11			
51	E0426617 N5023686	2	12			
52	E0426616 N5023688	2	10			
53	E0426615 N5023695	2	4			

Tree #	UTM coordinates	Category[1] *(1, 2, or 3[2])*	dbh[3] (cm)	Cultivated? *(Y/N)*	Proposed to be: *(enter one: killed, harmed or taken)*	Reason tree is proposed to be killed, harmed or taken:
54	E0426616 N5023698	1	3			
55	E0426612 N5023693	2	6			
56	E0426605 N5023690	2	1			
57	E0426609 N5023689	2	1			
58	E0426609 N5023689	2	1			
59	E0426607 N5023692	2	3			
60	E0426602 N5023684	2	5			
61	E0426606 N5023687	2	2			
62	E0426602 N5023681	2	8			
63	E0426609 N5023680	2	2			
64	E0426609 N5023679	2	1			
65	E0426614 N5023680	1	3			
66	E0426616 N5023673	2	5			
67	E0426620 N5023675	2	2			
68	E0426614 N5023673	1	1			
69	E0426613 N5023673	2	1			
70	E0426607 N5023670	2	2			
71	E0426606 N5023675	2	10			
72	E0426605 N5023667	2	3			
73	E0426599 N5023666	2	7			
74	E0426608 N5023668	2	2			
75	E0426613 N5023664	2	13			
76	E0426609 N5023662	2	4			
77	E0426615 N5023665	2	2			

Tree #	UTM coordinates	Category[1] *(1, 2, or 3[2])*	dbh[3] (cm)	Cultivated? *(Y/N)*	Proposed to be: *(enter one: killed, harmed or taken)*	Reason tree is proposed to be killed, harmed or taken:
78	E0426624 N5023663	1	5			
79	E0426628 N5023656	2	2			
80	E0426635 N5023657	3	27			
81	E0426634 N5023655	1	3			
82	E0426644 N5023655	2	14			
83	E0426643 N5023668	1	12			
84	E0426626 N5023637	1	27			
85	E0426633 N5023639	1	22			
86	E0426630 N5023646	3	27			
87	E0426629 N5023639	1	16			
88	E0426623 N5023643	1	17			
89	E0426611 N5023655	2	10			
90	E0426607 N5023650	1	2			
91	E0426590 N5023655	2	2			
92	E0426591 N5023647	2	1			
93	E0426576 N5023638	2	13			
94	E0426579 N5023635	2	1			
95	E0426581 N5023636	2	1			
96	E0426570 N5023618	2	27			
97	E0426568 N5023613	2	8			
98	E0426567 N5023621	2	10			
99	E0426567 N5023624	2	2			
100	E0426581 N5023625	1	8			
101	E0426628 N5023623	1	28			

Tree #	UTM coordinates	Category[1] *(1, 2, or 3[2])*	dbh[3] (cm)	Cultivated? *(Y/N)*	Proposed to be: *(enter one: killed, harmed or taken)*	Reason tree is proposed to be killed, harmed or taken:
102	E0426617 N5023610	1	62			
103	E0426603 N5023620	3	43			
104	E0426547 N5023582	1	14			
105	E0426512 N5023657	2	3			
106	E0426511 N5023656	2	8			
107	E0426497 N5023660	2	1			
108	E0426494 N5023661	2	4			
109	E0426490 N5023656	2	2			
110	E0426485 N5023652	2	2			
111	E0426427 N5023595	2	4			
112	E0426540 N5023622	2	3			
113	E0426528 N5023657	2	3			
114	E0426551 N5023633	2	37			
115	E0426548 N5023631	2	12			
116	E0426545 N5023652	1	6			
117	E0426545 N5023652	2	5			
118	E0426543 N5023648	2	2			
119	E0426552 N5023653	2	7			
120	E0426538 N5023654	2	9			
121	E0426542 N5023656	1	3			
122	E0426535 N5023657	2	4			
123	E0426544 N5023658	2	9			
124	E0426535 N5023665	2	1			
125	E0426532 N5023665	2	4			

Tree #	UTM coordinates	Category[1] *(1, 2, or 3[2])*	dbh[3] (cm)	Cultivated? *(Y/N)*	Proposed to be: *(enter one: killed, harmed or taken)*	Reason tree is proposed to be killed, harmed or taken:
126	E0426535 N5023671	2	4			
127	E0426541 N5023665	2	5			
128	E0426540 N5023596	2	2			
129	E0426549 N5023599	2	2			
130	E0426556 N5023601	1	3			
131	E0426563 N5023592	1	5			
132	E0426557 N5023592	2	8			
133	E0426569 N5023567	2	1			
134	E0426813 N5023526	2	8			
135	E0426809 N5023525	2	7			
136	E0426794 N5023601	2	7			
137	E0426737 N5023659	2	7			
138	E0426989 N5023869	3	23			
139	E0426980 N5023873	1	14			
140	E0426973 N5023868	1	26			
141	E0426970 N5023867	1	4			
142	E0426968 N5023863	1	4			
143	E0426963 N5023861	1	4			
144	E0426928 N5023836	1	11			
145	E0427079 N5024464	1	26			
146	E0427091 N5024445	2	1			
147	E0427065 N5024418	1	43			
148	E0427076 N5024412	1	27			
149	E0427081 N5024404	1	24			

Tree #	UTM coordinates	Category[1] *(1, 2, or 3[2])*	dbh[3] (cm)	Cultivated? *(Y/N)*	Proposed to be: *(enter one: killed, harmed or taken)*	Reason tree is proposed to be killed, harmed or taken:
150	E0426968 N5023861	2	19			
151	E0426991 N5023880	2	7			
152	E0426990 N5023879	2	8			
153	E0426992 N5023882	1	9			
154	E0427000 N5023889	1	13			
155	E0427038 N5023930	2	6			
156	E0427215 N5023898	2	4			
157	E0427214 N5023899	2	5			
158	E0426446 N5023775	2	20			
159	E0426428 N5023775	2	3			
160	E0426459 N5023819	2	14			
161	E0426466 N5023823	2	9			
162	E0426577 N5024074	1	41			
163	E0426593 N5024056	1	72			
164	E0426586 N5024042	1	15			
165	E0426600 N5024024	1	8			
166	E0426720 N5023848	2	35			
167	E0426797 N5023860	1	2			
168	E0426685 N5023964	1	26			
169	E0426693 N5023945	3	39			
170	E0426699 N5023939	1	18			
171	E0426633 N5023973	1	11			
172	E0426619 N5024013	1	23			
173	E0426620 N5024039	1	39			

Tree #	UTM coordinates	Category[1] *(1, 2, or 3[2])*	dbh[3] (cm)	Cultivated? *(Y/N)*	Proposed to be: *(enter one: killed, harmed or taken)*	Reason tree is proposed to be killed, harmed or taken:
174	E0426616 N5024022	1	16			
175	E0426601 N5024061	3	62			
176	E0426745 N5023905	2	2			
177	E0426910 N5024212	2	5			
178	E0426963 N5024073	2	1			
179	E0426965 N5023869	2	7			
180	E0426954 N5023867	1	7			
181	E0427076 N5024400	2	1			
182	E0427044 N5024365	3	85			
183	E0427044 N5024359	1	35			
184	E0427046 N5024366	1	58			
185	E0427028 N5024359	3	51			
186	E0427029 N5024356	1	53			
187	E0427013 N5014376	1	70			
188	E0427007 N5024359	1	43			
189	E0426991 N5024340	1	47			
190	E0427000 N5024341	1	47			
191	E0427005 N5024337	1	42			
192	E0427027 N5024344	1	39			
193	E0427011 N5024326	3	50			
194	E0426978 N5024327	1	49			
195	E0426980 N5024313	1	42			
196	E0326945 N5024325	1	65			
197	E0426935 N5024335	3	57			

Tree #	UTM coordinates	Category[1] *(1, 2, or 3[2])*	dbh[3] (cm)	Cultivated? *(Y/N)*	Proposed to be: *(enter one: killed, harmed or taken)*	Reason tree is proposed to be killed, harmed or taken:
198	E0426917 N5024311	3	67			
199	E0426926 N5024305	1	49			
200	E0426935 N5024304	1	37			
201	E0426920 N5024289	3	53			
202	E0426922 N5024266	2	52			
203	E0427115 N5024395	1	14			
204	E0427029 N5024320	3	38			
205	E0427014 N5024295	2	0			
206	E0427002 N5024302	1	45			
207	E0426991 N5024301	1	33			
208	E0426979 N5024300	1	31			
209	E0426990 N5024286	1	45			
210	E0426965 N5024283	1	29			
211	E0426939 N5024283	1	40			
212	E0426946 N5024298	1	38			
213	E0426951 N5024283	1	45			
214	E0426955 N5024271	3	33			
215	E0426951 N5024260	1	33			
216	E0426947 N5024271	2	0			
217	E0426947 N5024269	2	0			
218	E0426947 N5024271	3	37			
219	E0426936 N5024265	1	30			
220	E0426932 N5024271	1	26			
221	E0426929 N5024273	1	55			

Tree #	UTM coordinates	Category[1] *(1, 2, or 3[2])*	dbh[3] (cm)	Cultivated? *(Y/N)*	Proposed to be: *(enter one: killed, harmed or taken)*	Reason tree is proposed to be killed, harmed or taken:
222	E0426949 N5024233	1	13			
223	E0426937 N5024239	1	31			
224	E0426932 N5024250	1	16			
225	E0426880 N5024271	3	24			
226	E0426871 N5024271	2	16			
227	E0426825 N5024319	1	28			
228	E0426848 N5024374	3	71			
229	E0426858 N5024349	3	38			
230	E0426885 N5024330	1	29			
231	E0426881 N5024352	1	45			
232	E0426876 N5024368	1	44			
233	E0426889 N5024421	1	48			
234	E0426902 N5024410	1	51			
235	E0426961 N5024421	3	59			
236	E0426942 N5024441	1	44			
237	E0427022 N5024514	1	42			
238	E0427028 N5024517	1	32			
239	E0427050 N5024501	3	44			
240	E0427039 N5024504	3	39			
241	E0427039 N5024488	3	46			
242	E0427065 N5024489	1	41			
243	E0427061 N5024523	1	49			
244	E0427102 N5024564	2	25			

Table 2: Butternut trees that are **not** proposed to be killed, harmed or taken

Tree #	23UTM coordinates	Category (1, 2, or 3)	dbh[4] (cm)	Cultivated? (Y/N)

Table 3: Trees determined to be hybrid Butternuts

Tree #	UTM coordinates

Table 4: Summary of Assessment Results

Result:	**Total #:**	**Important information for persons planning activities that may affect Butternut:**
Category 1	95	• 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 MNR District Manager, no Butternut trees (of Category 1, 2, or 3) may be killed, harmed, or taken, and MNR 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 MNR District Manager, unless the results of an MNR 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	127	• 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 MNR District Manager, no Butternut trees (of Category 1, 2, or 3) may be killed, harmed, or taken, and MNR 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
Category 3	22	• 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

Result:	Total #:	Important information for persons planning activities that may affect Butternut:
		Regulation 242/08. • Visit the MNR website using the link below for information on how to seek an ESA authorization, or consider an alternative that will avoid killing, harming or taking any Category 3 trees: http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/MNR_SAR_HOW_DO_GET_PER_EN.html
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. • 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 MNR district office: http://www.mnr.gov.on.ca/en/ContactUs/2ColumnSubPage/STEL02_179002.html • 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.

NOTE: This concludes the summary of the BHA Report. A complete BHA Report must include the original (hard copy) data forms (i.e., all completed sets of Form 1 and Form 2) and an electronic copy 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 #	18-004	Assessment Date(s)	May 24, 29, June 20, 22, 25, 30, 2018	Total # Butternut Trees in BHA Report	244
BHA ID #	2	BHA Name	Rosemary Fleguel		
Landowner / Client Name			Minto Canada Inc.		
Property Location			936 March Rd., Kanata		

input field data										automatic calculations from field data						Categories: 1: non-retainable, 2: retainable, 3: archivable				
Tree #	Live Crown %	Tree dbh (cm)	# bole cankers: sooty (S) (will be assigned 2.5 cm per canker)		# bole cankers: open (O) (will be assigned 5 cm per canker)		# root flare (RF) cankers		<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	95	7	2	0	0	0	0	0		21.98	5.0	0.0	**22.7**	**0.0**	**11.4**	1	2	1	**2**	**2**
2	90	22	7	1	0	0	1	0	n	69.08	20.0	2.5	**29.0**	**3.6**	**16.3**	1	2	1	**2**	**2**
3	50	4	0	0	0	0	0	0		12.56	0.0	0.0	**0.0**	**0.0**	**0.0**	2	1	1	**2**	**2**
4	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**
5	95	4	0	0	0	0	0	0		12.56	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
6	95	13	0	0	0	0	0	0		40.82	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
7	95	10	0	0	0	0	0	1		31.4	0.0	5.0	**0.0**	**15.9**	**8.0**	2	2	2	**2**	**2**
8	50	14	3	0	0	0	0	0		43.96	7.5	0.0	**17.1**	**0.0**	**8.5**	1	1	1	**1**	**1**
9	95	16	0	0	0	0	1	2		50.24	0.0	12.5	**0.0**	**24.9**	**12.4**	2	2	2	**2**	**2**
10	85	3	0	0	0	0	0	0		9.42	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
11	10	1								3.14	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
12	90	8	0	0	0	0	0	1		25.12	0.0	5.0	**0.0**	**19.9**	**10.0**	2	2	2	**2**	**2**
13	95	11	0	0	0	0	0	0		34.54	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
14	90	13	0	0	0	0	0	0		40.82	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
15	95	14	0	0	0	0	0	0		43.96	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
16	0	4								12.56	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
17	75	1	0	0	1	0	0	0		3.14	5.0	0.0	**159.2**	**0.0**	**79.6**	1	1	1	**1**	**1**
18	100	4	0	0	0	0	0	1		12.56	0.0	5.0	**0.0**	**39.8**	**19.9**	2	2	2	**2**	**2**
19	100	5	0	0	0	0	1	0		15.7	0.0	2.5	**0.0**	**15.9**	**8.0**	2	2	2	**2**	**2**
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	0	4								12.56	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
22	90	3	0	0	0	0	0	0		9.42	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
23	90	3	0	0	0	0	0	1		9.42	0.0	5.0	**0.0**	**53.1**	**26.5**	2	1	2	**2**	**2**
24	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**
25	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**
26	100	2	1	0	0	0	0	0		6.28	2.5	0.0	**39.8**	**0.0**	**19.9**	1	2	1	**2**	**2**
27	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**
28	95	10	1	1	3	0	0	1		31.4	20.0	5.0	**63.7**	**15.9**	**39.8**	1	1	1	**1**	**1**
29	95	11	3	0	3	0	2	1		34.54	22.5	10.0	**65.1**	**29.0**	**47.0**	1	1	1	**1**	**1**
30	95	16	0	0	0	0	0	0		50.24	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
31	100	3	0	0	0	0	0	0		9.42	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**

32	95	33	7	0	0	0	0	1	n	103.6	17.5	5.0	**16.9**	**4.8**	**10.9**	1	2	2	**2**	**2**
33	95	22	1	0	1	0	3	1	n	69.08	7.5	12.5	**10.9**	**18.1**	**14.5**	1	2	2	**2**	**2**
34	95	13	0	0	3	0	0	2		40.82	15.0	10.0	**36.7**	**24.5**	**30.6**	1	1	1	**1**	**1**
35	95	6	1	0	0	0	1	2		18.84	2.5	12.5	**13.3**	**66.3**	**39.8**	1	1	2	**2**	**2**
36	90	6	3	0	1	1	1	1		18.84	17.5	7.5	**92.9**	**39.8**	**66.3**	1	1	1	**1**	**1**
37	0	5								15.7	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
38	90	5	2	0	2	0	0	1		15.7	15.0	5.0	**95.5**	**31.8**	**63.7**	1	1	1	**1**	**1**
39	95	3	0	0	0	0	0	0		9.42	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
40	95	3	0	0	0	0	2	2		9.42	0.0	15.0	**0.0**	**159.2**	**79.6**	2	1	2	**2**	**2**
41	95	5	0	0	0	0	0	0		15.7	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
42	95	5	0	0	1	0	0	0		15.7	5.0	0.0	**31.8**	**0.0**	**15.9**	1	2	1	**2**	**2**
43	100	13	0	0	0	0	0	0		40.82	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
44	100	5	0	0	0	0	0	0		15.7	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
45	100	6	0	0	1	0	0	0		18.84	5.0	0.0	**26.5**	**0.0**	**13.3**	1	2	1	**2**	**2**
46	100	6	0	0	0	0	0	1		18.84	0.0	5.0	**0.0**	**26.5**	**13.3**	2	2	2	**2**	**2**
47	100	5	1	0	0	0	0	0		15.7	2.5	0.0	**15.9**	**0.0**	**8.0**	1	2	2	**2**	**2**
48	100	8	0	0	0	0	0	0		25.12	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
49	95	16	0	0	0	0	1	2		50.24	0.0	12.5	**0.0**	**24.9**	**12.4**	2	2	2	**2**	**2**
50	95	11	0	0	0	0	0	0		34.54	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
51	100	12	1	0	0	0	0	0		37.68	2.5	0.0	**6.6**	**0.0**	**3.3**	1	2	2	**2**	**2**
52	100	10	0	0	0	0	0	0		31.4	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
53	100	4	0	0	0	0	0	0		12.56	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
54	70	3	0	0	1	0	0	1		9.42	5.0	5.0	**53.1**	**53.1**	**53.1**	1	1	1	**1**	**1**
55	100	6	0	0	0	0	0	1		18.84	0.0	5.0	**0.0**	**26.5**	**13.3**	2	2	2	**2**	**2**
56	90	1	0	0	0	0	0	0		3.14	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
57	100	4	0	0	0	0	0	0		12.56	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
58	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**
59	70	3	0	0	0	0	0	1		9.42	0.0	5.0	**0.0**	**53.1**	**26.5**	2	1	1	**2**	**2**
60	100	5	0	0	0	0	0	0		15.7	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
61	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**
62	100	8	0	0	0	0	0	0		25.12	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
63	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**
64	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**
65	100	3	0	0	1	0	0	1		9.42	5.0	5.0	**53.1**	**53.1**	**53.1**	1	1	1	**1**	**1**
66	100	5	0	0	0	0	0	0		15.7	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
67	70	2	0	0	0	0	0	0		6.28	0.0	0.0	**0.0**	**0.0**	**0.0**	2	1	1	**2**	**2**
68	0	1								3.14	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
69	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**
70	70	2	0	0	0	0	0	0		6.28	0.0	0.0	**0.0**	**0.0**	**0.0**	2	1	1	**2**	**2**
71	100	10	0	0	0	0	0	0		31.4	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
72	100	3	0	0	0	0	0	0		9.42	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
73	100	7	0	0	0	0	0	0		21.98	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
74	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**
75	100	13	0	0	0	0	0	0		40.82	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
76	100	4	0	0	1	0	0	0		12.56	5.0	0.0	**39.8**	**0.0**	**19.9**	1	2	1	**2**	**2**
77	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**
78	95	5	0	0	2	0	0	1		15.7	10.0	5.0	**63.7**	**31.8**	**47.8**	1	1	1	**1**	**1**
79	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**
80	100	27	0	0	1	0	0	0	y	84.78	5.0	0.0	**5.9**	**0.0**	**2.9**	1	2	2	**2**	**3**

81	90	3	2	0	1	0	0	0		9.42	10.0	0.0	**106.2**	**0.0**	**53.1**	1	1	1	**1**	**1**
82	95	14	0	0	0	0	1	1		43.96	0.0	7.5	**0.0**	**17.1**	**8.5**	2	2	2	**2**	**2**
83	85	12	0	0	2	0	2	1		37.68	10.0	10.0	**26.5**	**26.5**	**26.5**	1	1	1	**1**	**1**
84	95	27	9	0	0	0	6	1		84.78	22.5	20.0	**26.5**	**23.6**	**25.1**	1	1	1	**1**	**1**
85	95	22	3	2	1	0	5	0		69.08	17.5	12.5	**25.3**	**18.1**	**21.7**	1	1	1	**1**	**1**
86	95	27	3	2	1	0	5	0	y	84.78	17.5	12.5	**20.6**	**14.7**	**17.7**	1	2	1	**2**	**3**
87	40	16								50.24	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
88	90	10	4	2	1	1	3	2		31.4	25.0	17.5	**79.6**	**55.7**	**67.7**	1	1	1	**1**	**1**
89	95	10	2	0	0	0	0	1		31.4	5.0	5.0	**15.9**	**15.9**	**15.9**	1	2	2	**2**	**2**
90	90	2	1	0	2	0	0	1		6.28	12.5	5.0	**199.0**	**79.6**	**139.3**	1	1	1	**1**	**1**
91	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**
92	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**
93	95	13	0	0	0	0	0	0		40.82	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
94	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**
95	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**
96	95	27	0	0	0	0	1	0	n	84.78	0.0	2.5	**0.0**	**2.9**	**1.5**	2	2	2	**2**	**2**
97	100	8	0	0	0	0	0	2		25.12	0.0	10.0	**0.0**	**39.8**	**19.9**	2	2	2	**2**	**2**
98	95	10	2	0	0	0	0	2		31.4	5.0	10.0	**15.9**	**31.8**	**23.9**	1	1	2	**2**	**2**
99	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**
100	100	8	1	0	2	0	0	1		25.12	12.5	5.0	**49.8**	**19.9**	**34.8**	1	1	1	**1**	**1**
101	40	28								87.92	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
102	60	62	8	2	0	0	1	1		194.7	25.0	7.5	**12.8**	**3.9**	**8.3**	1	1	1	**1**	**1**
103	95	43	3	2	0	0	2	2	y	135	12.5	15.0	**9.3**	**11.1**	**10.2**	1	2	2	**2**	**3**
104	95	14	6	0	0	0	4	0		43.96	15.0	10.0	**34.1**	**22.7**	**28.4**	1	1	1	**1**	**1**
105	95	3	0	0	0	0	0	0		9.42	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
106	100	8	0	0	0	0	0	0		25.12	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
107	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**
108	100	4	0	0	0	0	0	0		12.56	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
109	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**
110	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**
111	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**
112	100	3	0	0	0	0	0	0		9.42	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
113	100	3	0	0	0	0	0	0		9.42	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
114	95	37	11	0	0	0	2	0	n	116.2	27.5	5.0	**23.7**	**4.3**	**14.0**	1	2	1	**2**	**2**
115	95	12	1	0	0	0	2	0		37.68	2.5	5.0	**6.6**	**13.3**	**10.0**	1	2	2	**2**	**2**
116	95	6	3	0	1	0	0	0		18.84	12.5	0.0	**66.3**	**0.0**	**33.2**	1	1	1	**1**	**1**
117	95	5	1	0	0	0	0	0		15.7	2.5	0.0	**15.9**	**0.0**	**8.0**	1	2	2	**2**	**2**
118	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**
119	100	7	0	0	0	0	0	0		21.98	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
120	95	9	3	0	0	0	0	0		28.26	7.5	0.0	**26.5**	**0.0**	**13.3**	1	2	1	**2**	**2**
121	100	3	1	0	1	0	0	0		9.42	7.5	0.0	**79.6**	**0.0**	**39.8**	1	1	1	**1**	**1**
122	100	4	0	0	0	0	0	0		12.56	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
123	95	9	0	0	0	0	0	0		28.26	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
124	124	1	0	0	0	0	0	0		3.14	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
125	100	4	0	0	0	0	0	0		12.56	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
126	100	4	1	0	0	0	0	0		12.56	2.5	0.0	**19.9**	**0.0**	**10.0**	1	2	2	**2**	**2**
127	100	5	0	0	0	0	0	0		15.7	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
128	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**
129	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**

130	100	3	0	0	1	0	0	0		9.42	5.0	0.0	**53.1**	**0.0**	**26.5**	1	1	1	**1**	**1**
131	100	5	3	0	0	0	2	0		15.7	7.5	5.0	**47.8**	**31.8**	**39.8**	1	1	1	**1**	**1**
132	100	8	0	0	0	0	0	0		25.12	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
133	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**
134	100	8	1	0	0	0	0	0		25.12	2.5	0.0	**10.0**	**0.0**	**5.0**	1	2	2	**2**	**2**
135	100	7	1	0	0	0	0	1		21.98	2.5	5.0	**11.4**	**22.7**	**17.1**	1	2	2	**2**	**2**
136	100	7	1	0	0	0	0	0		21.98	2.5	0.0	**11.4**	**0.0**	**5.7**	1	2	2	**2**	**2**
137	100	7	0	0	1	0	0	0		21.98	5.0	0.0	**22.7**	**0.0**	**11.4**	1	2	1	**2**	**2**
138	100	23	1	0	0	0	2	0	y	72.22	2.5	5.0	**3.5**	**6.9**	**5.2**	1	2	2	**2**	**3**
139	95	14	7	1	6	3	3	1		43.96	65.0	12.5	**147.9**	**28.4**	**88.1**	1	1	1	**1**	**1**
140	90	26	3	0	5	0	2	2		81.64	32.5	15.0	**39.8**	**18.4**	**29.1**	1	1	1	**1**	**1**
141	90	4	3	0	2	1	2	0		12.56	22.5	5.0	**179.1**	**39.8**	**109.5**	1	1	1	**1**	**1**
142	70	4	4	0	2	0	0	2		12.56	20.0	10.0	**159.2**	**79.6**	**119.4**	1	1	1	**1**	**1**
143	0	4								12.56	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
144	80	11	3	0	2	1	1	1		34.54	22.5	7.5	**65.1**	**21.7**	**43.4**	1	1	1	**1**	**1**
145	95	26	1	3	2	5	4	3		81.64	45.0	25.0	**55.1**	**30.6**	**42.9**	1	1	1	**1**	**1**
146	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**
147	0	43								135	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
148	30	27								84.78	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
149	30	24								75.36	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
150	95	19	1	0	2	0	0	0		59.66	12.5	0.0	**21.0**	**0.0**	**10.5**	1	2	1	**2**	**2**
151	100	7	0	0	0	0	0	0		21.98	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
152	100	8	1	0	0	0	1	1		25.12	2.5	7.5	**10.0**	**29.9**	**19.9**	1	2	2	**2**	**2**
153	90	9	3	0	5	0	3	0		28.26	32.5	7.5	**115.0**	**26.5**	**70.8**	1	1	1	**1**	**1**
154	95	13	5	1	3	2	0	0		40.82	40.0	0.0	**98.0**	**0.0**	**49.0**	1	1	1	**1**	**1**
155	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**
156	100	4	0	0	0	0	0	0		12.56	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
157	100	5	0	0	0	0	0	0		15.7	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
158	90	20	1	0	0	0	0	0	n	62.8	2.5	0.0	**4.0**	**0.0**	**2.0**	1	2	2	**2**	**2**
159	100	3	0	0	0	0	0	0		9.42	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
160	100	14	0	0	0	0	0	0		43.96	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
161	100	9	0	0	0	0	0	0		28.26	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
162	30	41								128.7	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
163	90	72	11	12	3	2	9	4		226.1	82.5	42.5	**36.5**	**18.8**	**27.6**	1	1	1	**1**	**1**
164	95	15	2	0	3	0	4	0		47.1	20.0	10.0	**42.5**	**21.2**	**31.8**	1	1	1	**1**	**1**
165	95	8	3	0	1	0	2	1		25.12	12.5	10.0	**49.8**	**39.8**	**44.8**	1	1	1	**1**	**1**
166	95	35	0	0	0	0	0	0	n	109.9	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
167	95	2	1	0	1	0	0	0		6.28	7.5	0.0	**119.4**	**0.0**	**59.7**	1	1	1	**1**	**1**
168	60	26	5	4	8	2	1	5		81.64	72.5	27.5	**88.8**	**33.7**	**61.2**	1	1	1	**1**	**1**
169	70	39	0	0	0	0	1	0	y	122.5	0.0	2.5	**0.0**	**2.0**	**1.0**	2	1	1	**2**	**3**
170	30	18								56.52	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
171	100	11	5	0	0	0	1	0		34.54	12.5	2.5	**36.2**	**7.2**	**21.7**	1	1	1	**1**	**1**
172	90	23	10	0	0	0	0	2		72.22	25.0	10.0	**34.6**	**13.8**	**24.2**	1	1	1	**1**	**1**
173	0	39								122.5	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
174	40	16								50.24	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
175	90	62	12	5	0	0	10	0	y	194.7	42.5	25.0	**21.8**	**12.8**	**17.3**	1	2	1	**2**	**3**
176	90	2	1	0	0	0	0	0		6.28	2.5	0.0	**39.8**	**0.0**	**19.9**	1	2	1	**2**	**2**
177	100	5	0	0	0	0	0	0		15.7	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
178	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**

179	100	7	2	0	0	0	0	0		21.98	5.0	0.0	**22.7**	**0.0**	**11.4**	1	2	1	**2**	**2**
180	100	7	1	0	2	0	0	0		21.98	12.5	0.0	**56.9**	**0.0**	**28.4**	1	1	1	**1**	**1**
181	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**
182	90	85	5	1	3	1	4	6	y	266.9	35.0	40.0	**13.1**	**15.0**	**14.1**	1	2	2	**2**	**3**
183	30	35								109.9	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
184	40	58								182.1	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
185	75	51	3	1	0	1	2	4	y	160.1	15.0	25.0	**9.4**	**15.6**	**12.5**	1	2	2	**2**	**3**
186	0	53								166.4	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
187	10	70								219.8	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
188	0	43								135	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
189	30	47								147.6	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
190	40	47								147.6	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
191	20	42								131.9	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
192	75	39	1	2	3	5	5	3		122.5	47.5	27.5	**38.8**	**22.5**	**30.6**	1	1	1	**1**	**1**
193	90	50	5	3	1	0	2	2	y	157	25.0	15.0	**15.9**	**9.6**	**12.7**	1	2	2	**2**	**3**
194	0	49								153.9	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
195	0	42								131.9	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
196	40	65								204.1	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
197	80	57	4	1	1	1	3	3	y	179	22.5	22.5	**12.6**	**12.6**	**12.6**	1	2	2	**2**	**3**
198	90	67	11	2	2	0	6	0	y	210.4	42.5	15.0	**20.2**	**7.1**	**13.7**	1	2	1	**2**	**3**
199	0	49								153.9	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
200	10	37								116.2	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
201	75	53	5	1	1	0	3	4	y	166.4	20.0	27.5	**12.0**	**16.5**	**14.3**	1	2	2	**2**	**3**
202	80	52	1	0	0	0	1	2	n	163.3	2.5	12.5	**1.5**	**7.7**	**4.6**	1	2	2	**2**	**2**
203	10	14								43.96	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
204	85	38	4	0	1	0	0	0	y	119.3	15.0	0.0	**12.6**	**0.0**	**6.3**	1	2	2	**2**	**3**
205	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**
206	40	45								141.3	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
207	0	33								103.6	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
208	0	31								97.34	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
209	0	45								141.3	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
210	0	29								91.06	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
211	0	40								125.6	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
212	40	38								119.3	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
213	30	45								141.3	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
214	85	33	0	0	0	0	1	0	Y	103.6	0.0	2.5	**0.0**	**2.4**	**1.2**	2	2	2	**2**	**3**
215	0	32								100.5	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
216	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**
217	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**
218	90	37	2	1	0	0	1	6	Y	116.2	7.5	32.5	**6.5**	**28.0**	**17.2**	1	2	2	**2**	**3**
219	10	30								94.2	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
220	0	26								81.64	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
221	30	55								172.7	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
222	80	13	4	0	4	1	0	3		40.82	35.0	15.0	**85.7**	**36.7**	**61.2**	1	1	1	**1**	**1**
223	90	31	6	4	0	1	5	1		97.34	30.0	17.5	**30.8**	**18.0**	**24.4**	1	1	1	**1**	**1**
224	30	16								50.24	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
225	95	24	3	0	2	0	2	1	Y	75.36	17.5	10.0	**23.2**	**13.3**	**18.2**	1	2	1	**2**	**3**
226	90	16	0	0	1	1	0	2		50.24	10.0	10.0	**19.9**	**19.9**	**19.9**	1	2	2	**2**	**2**
227	40	28								87.92	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**

228	90	71	3	0	1	0	8	2	Y	222.9	12.5	30.0	**5.6**	**13.5**	**9.5**	1	2	2	**2**	**3**
229	80	38	3	1	1	0	0	2	Y	119.3	15.0	10.0	**12.6**	**8.4**	**10.5**	1	2	2	**2**	**3**
230	20	29								91.06	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
231	10	45								141.3	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
232	0	44								138.2	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
233	20	48								150.7	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
234	0	51								160.1	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
235	90	59	0	0	1	0	0	4	Y	185.3	5.0	20.0	**2.7**	**10.8**	**6.7**	1	2	2	**2**	**3**
236	0	44								138.2	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
237	20	42								131.9	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
238	0	32								100.5	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
239	75	44	1	1	0	0	0	5	y	138.2	5.0	25.0	**3.6**	**18.1**	**10.9**	1	2	2	**2**	**3**
240	95	39	3	3	1	0	1	0	y	122.5	20.0	2.5	**16.3**	**2.0**	**9.2**	1	2	2	**2**	**3**
241	90	46	0	0	1	0	3	0	y	144.4	5.0	7.5	**3.5**	**5.2**	**4.3**	1	2	2	**2**	**3**
242	40	41								128.7	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
243	40	49								153.9	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
244	90	25	2	2	0	1	0	1	n	78.5	15.0	5.0	**19.1**	**6.4**	**12.7**	1	2	2	**2**	**2**
245										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) 24 - 05 - 2018

Shaded fields are mandatory for Butternut Health Assessments

Surveyor Contact
First ROSEMARY Last FLESUEL
Email
Telephone (613) 858-3678 Telephone Other ( ) - X

Property Owner (check if same as surveyor) ☐
First BETH Last HENDERSON
or Company MINTO COMMUNITIES CANADA LTD
Email
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#) 936 MARCH RD
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

Trees #145-149 are out of order - someone jumped from 144 to 150

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

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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): 24-05-2018

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

Tree # 1

Zone 18 | Easting 426657 | Northing 5023571

2 | Crown Class | Live Crown %: 95 | Main Stem Length(m) Below crown: 1 | 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: #Epic-Live: 0 | #Epic-Dead: 0 | Bark Type: D | # Callused Wounds: 0

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

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

Competing Species:

Tree # 2

Zone 18 | Easting 426653 | Northing 5023556

2 | Crown Class | Live Crown %: 90 | Main Stem Length(m) Below crown: 2 | 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: 0 | #Epic-Dead: 0 | Bark Type: D | # Callused Wounds: 1

	#Open	#Sooty
Root	6	1
=<2m	0	7
>2m	0	1

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

Competing Species:

Tree # 3

Zone 18 | Easting 426741 | Northing 5023456

Crown Class | Live Crown %: 50 | Main Stem Length(m) Below crown: 1 | Seed Signs

2 | Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems: 1 | DBH(cm): 4

Butternut Origin: Natural | Planted | Unknown

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

Assess below live crown: #Epic-Live: 0 | #Epic-Dead: 0 | Bark Type: D | # Callused Wounds: 1

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

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

Competing Species:

Deer rub on stem

Tree # 4

Zone 18 | Easting 426782 | Northing 5023489

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

2 | 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: 3

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

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

Competing Species:

~approx. 1m S off S boundary in backyard of house - did not assess

Tree # 5

Zone 18 | Easting 426786 | Northing 5023502

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

2 | Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems: 1 | DBH(cm): 4

Butternut Origin: Natural | Planted | Unknown

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

Assess below live crown: #Epic-Live: 0 | #Epic-Dead: 0 | Bark Type: D | # Callused Wounds: 3

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

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

Competing Species:

Deer rub on stem

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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 # 062

Surveyor Last Name | Date (dd/mm/yyyy) 24-05-2018

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

Tree # 6 | Zone 18 | Easting 426729 | Northing 5023637

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

2 | Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 2 | DBH(cm) 13

Butternut Origin: Natural | Planted | Unknown

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

Assess below live crown: #Epic-Live 0 | #Epic-Dead 0 | Bark Type D | # Callused Wounds 4

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

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

Competing Species:

Deer rub on stem

Tree # 7 | Zone 18 | Easting 426736 | Northing 5023642

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

2 | Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 10

Butternut Origin: Natural | Planted | Unknown

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

Assess below live crown: #Epic-Live 0 | #Epic-Dead 0 | Bark Type D | # Callused Wounds 1

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

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

Competing Species:

Tree # 8 | Zone 18 | Easting 426711 | Northing 5023600

Crown Class | Live Crown % 50 | Main Stem Length(m) Below crown 2 | Seed Signs

1 | Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 14

Butternut Origin: Natural | Planted | Unknown

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

Assess below live crown: #Epic-Live 0 | #Epic-Dead 0 | Bark Type D | # Callused Wounds 3

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

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

Competing Species:

Tree # 9 | Zone 18 | Easting 426715 | Northing 5023595

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

2 | Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 2 | DBH(cm) 16

Butternut Origin: Natural | Planted | Unknown

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

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

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

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

Competing Species:

Tree # 10 | Zone 18 | Easting 426686 | Northing 5023583

Crown Class | Live Crown % 85 | Main Stem Length(m) Below crown 1 | Seed Signs

2 | Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 3 | DBH(cm) 3

Butternut Origin: Natural | Planted | Unknown

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

Assess below live crown: #Epic-Live 0 | #Epic-Dead 0 | Bark Type D | # Callused Wounds 2

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

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

Competing Species:

Deer rub on main stem

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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 # | Surveyor Last Name | Date (dd/mm/yyyy): 24 - 05 - 2018

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

Tree # 11 | Zone 18 | Easting 426683 | Northing 5023583

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

1 | ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | 3 #Stems | DBH(cm) 1 | Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown | ☐ 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 # 12 | Zone 18 | Easting 426682 | Northing 5023583

Crown Class | Live Crown % 90 | Main Stem Length(m) Below crown 1 | Seed Signs

2 | ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | 1 #Stems | DBH(cm) 8 | Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown | ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown: 0 #Epic-Live | 1 #Epic-Dead | D Bark Type | 2 # Callused Wounds

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

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

Competing Species

Deer rub on stem

Tree # 13 | Zone 18 | Easting 426679 | Northing 5023584

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

2 | ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | 1 #Stems | DBH(cm) 11 | Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown | ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown: 0 #Epic-Live | 0 #Epic-Dead | D Bark Type | 2 # Callused Wounds

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

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

Competing Species

Mechanical damage on stem

Tree # 14 | Zone 18 | Easting 426672 | Northing 5023584

Crown Class | Live Crown % 90 | Main Stem Length(m) Below crown 6 | Seed Signs

2 | ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | 1 #Stems | DBH(cm) 13 | Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown | ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown: 0 #Epic-Live | 0 #Epic-Dead | D Bark Type | 2 # Callused Wounds

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

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

Competing Species

Rope used to tie branch back - removed to avoid imminent girdling

---

Tree # 15 | Zone 18 | Easting 426669 | Northing 5023585

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

2 | ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | 1 #Stems | DBH(cm) 14 | Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown | ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown: 0 #Epic-Live | 0 #Epic-Dead | D Bark Type | 2 # Callused Wounds

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

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

Competing Species

Rope used to tie branch back to stem - removed to avoid imminent girdling

---

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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) 24 - 05 - 2018

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

Tree # 16 | Zone 18 | Easting 426667 | Northing 5023580

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

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems 1 | DBH(cm) 4

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 # 17 | Zone 18 | Easting 426657 | Northing 5023574

Crown Class | Live Crown % 75 | Main Stem Length(m) Below crown 1 | Seed Signs

☐ 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 0 | #Epic-Dead 0 | Bark Type D | # Callused Wounds 0

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

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

Competing Species

Tree # 18 | Zone 18 | Easting 426577 | Northing 5023546

Crown Class | Live Crown % 100 | Main Stem Length(m) Below crown 1 | Seed Signs

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems 1 | DBH(cm) 4

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

Assess below live crown: #Epic-Live 0 | #Epic-Dead 0 | Bark Type D | # Callused Wounds 1

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

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

Competing Species

Tree # 19 | Zone 18 | Easting 426576 | Northing 5023537

Crown Class | Live Crown % 100 | Main Stem Length(m) Below crown 1 | Seed Signs

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems 1 | DBH(cm) 5

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

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

	#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 426575 | Northing 5023537

Crown Class | Live Crown % 100 | Main Stem Length(m) Below crown 1 | Seed Signs

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

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

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

Flagged stick beside seedling

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

Surveyor Last Name

Date (dd/mm/yyyy) 24 - 05 - 2018

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

Tree # 21 | Zone 18 | Easting 426575 | Northing 5023537

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 4 | DBH(cm) 2

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 # 22 | Zone 18 | Easting 426565 | Northing 5023532

Crown Class | Live Crown % 90 | Main Stem Length(m) Below crown 1

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

Butternut Origin: Natural | Planted | Unknown

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

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

Tree # 23 | Zone 18 | Easting 426596 | Northing 5023526

Crown Class | Live Crown % 90 | Main Stem Length(m) Below crown 1

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

Butternut Origin: Natural | Planted | Unknown

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

Assess below live crown: #Epic-Live 0 | #Epic-Dead 0 | Bark Type D | # 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 # 24 | Zone 18 | Easting 426601 | Northing 5023519

Crown Class | Live Crown % 100 | Main Stem Length(m) Below crown 1

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 0 | #Epic-Dead 0 | Bark Type D | # 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

Tree # 25 | Zone 18 | Easting 426644 | Northing 5023491

Crown Class | Live Crown % 100 | Main Stem Length(m) Below crown 1

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 0 | #Epic-Dead 0 | Bark Type D | # 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

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

Surveyor Last Name | Date (dd/mm/yyyy): 24 - 05 - 2018

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

Tree # 26 | Zone 18 | Easting 426632 | Northing 5023521

Crown Class: 2 | Live Crown %: 100 | Main Stem Length(m) Below crown: 1

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

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

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

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

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

Competing Species:

Tree # 27 | Zone 18 | Easting 426641 | Northing 5023508

Crown Class: 2 | Live Crown %: 100 | Main Stem Length(m) Below crown: 1

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

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

Assess below live crown: #Epic-Live: 0 | #Epic-Dead: 0 | Bark Type: D | # Callused Wounds: 1

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

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

Competing Species:

Dur rub a stem

Tree # 28 | Zone 18 | Easting 426659 | Northing 5023663

Crown Class: 1 | Live Crown %: 95 | Main Stem Length(m) Below crown: 2

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems: 1 | DBH(cm): 10

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

Assess below live crown: #Epic-Live: 0 | #Epic-Dead: 3 | Bark Type: D | # Callused Wounds: 6

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

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

Competing Species:

Tree # 29 | Zone 18 | Easting 426661 | Northing 5023663

Crown Class: 1 | Live Crown %: 95 | Main Stem Length(m) Below crown: 2

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems: 2 | DBH(cm): 11

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

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

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

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

Competing Species:

Tree # 30 | Zone 18 | Easting 426655 | Northing 5023665

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems: 1 | DBH(cm): 16

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

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

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

Surveyor Last Name

Date (dd/mm/yyyy) 24 - 05 - 2018

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

Tree # 31 | Zone 18 | Easting 426669 | Northing 5023647

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

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

Butternut Origin: Natural | Planted | Unknown

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

Assess below live crown: #Epic-Live 0 | #Epic-Dead 0 | Bark Type D | # Callused Wounds 3

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

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

Competing Species

Tree # 32 | Zone 18 | Easting 426667 | Northing 5023648

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 33

Butternut Origin: Natural | Planted | Unknown

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

Assess below live crown: #Epic-Live 0 | #Epic-Dead 0 | Bark Type D | # Callused Wounds 10

	#Open	#Sooty
Root	1	0
=<2m	0	7
>2m	0	0

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

Competing Species

Tree # 33 | Zone 18 | Easting 426638 | Northing 5023668

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 2 | DBH(cm) 22

Butternut Origin: Natural | Planted | Unknown

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

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

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

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

Competing Species

Tree # 34 | Zone 18 | Easting 426638 | Northing 5023670

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 13

Butternut Origin: Natural | Planted | Unknown

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

Assess below live crown: #Epic-Live 0 | #Epic-Dead 0 | Bark Type D | # Callused Wounds 1

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

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

Competing Species

Tree # 35 | Zone 18 | Easting 426650 | Northing 5023667

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

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

Butternut Origin: Natural | Planted | Unknown

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

Assess below live crown: #Epic-Live 0 | #Epic-Dead 0 | Bark Type D | # Callused Wounds 2

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

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

Competing Species

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Surveyor Last Name | Date (dd/mm/yyyy): 24 - 05 - 2018

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

Tree # 36 | Zone 18 | Easting 426636 | Northing 5023667

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

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

Butternut Origin: Natural | Planted | Unknown

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

Assess below live crown: #Epic-Live: 0 | #Epic-Dead: 1 | Bark Type: D | # Callused Wounds: 1

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

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

Competing Species

Tree # 37 | Zone 18 | Easting 426640 | Northing 5023669

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems: 1 | DBH(cm): 5

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 # 38 | Zone 18 | Easting 426634 | Northing 5023681

Crown Class | Live Crown %: 90 | Main Stem Length(m) Below crown: 1

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems: 1 | DBH(cm): 5

Butternut Origin: Natural | Planted | Unknown

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

Assess below live crown: #Epic-Live: 0 | #Epic-Dead: 3 | Bark Type: D | # Callused Wounds: 1

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

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

Competing Species

Tree # 39 | Zone 18 | Easting 426638 | Northing 5023682

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

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

Butternut Origin: Natural | Planted | Unknown

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

Assess below live crown: #Epic-Live: 0 | #Epic-Dead: 0 | Bark Type: D | # Callused Wounds: 2

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

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

Competing Species

Tree # 40 | Zone 18 | Easting 426635 | Northing 5023683

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

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

Butternut Origin: Natural | Planted | Unknown

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

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

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

Surveyor Last Name

Date (dd/mm/yyyy) 24 - 05 - 2018

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

Tree # 41 | Zone 18 | Easting 426635 | Northing 5023683

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

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems | DBH(cm) 5

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

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

Tree # 42 | Zone 18 | Easting 426634 | Northing 5023684

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

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems | DBH(cm) 5

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

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

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

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

Competing Species

Tree # 43 | Zone 18 | Easting 426626 | Northing 5023680

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

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems 1 | DBH(cm) 13

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

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

Tree # 44 | Zone 18 | Easting 426623 | Northing 5023679

Crown Class | Live Crown % 100 | Main Stem Length(m) Below crown 1

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems 1 | DBH(cm) 5

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

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

Tree # 45 | Zone 18 | Easting 426624 | Northing 5023672

Crown Class | Live Crown % 100 | Main Stem Length(m) Below crown 1

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

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

Assess below live crown: #Epic-Live 0 | #Epic-Dead 0 | Bark Type D | # Callused Wounds 3

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

Surveyor Last Name | Date (dd/mm/yyyy): 24 - 05 - 2018

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

Tree 1

Tree #: 46 | Zone: 18 | Easting: 426625 | Northing: 5023672

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

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

Butternut Origin: Natural | Planted | Unknown

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

Assess below live crown: #Epic-Live: 0 | #Epic-Dead: 0 | Bark Type: D | # Callused Wounds: 2

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

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

Competing Species

Tree 2

Tree #: 47 | Zone: 18 | Easting: 426628 | Northing: 5023676

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

2 | Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems: 1 | DBH(cm): 5

Butternut Origin: Natural | Planted | Unknown

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

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

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

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

Competing Species

Tree 3

Tree #: 48 | Zone: 18 | Easting: 426621 | Northing: 5023671

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

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

Butternut Origin: Natural | Planted | Unknown

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

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

Tree 4

Tree #: 49 | Zone: 18 | Easting: 426618 | Northing: 5023684

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

2 | Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems: 1 | DBH(cm): 16

Butternut Origin: Natural | Planted | Unknown

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

Assess below live crown: #Epic-Live: 0 | #Epic-Dead: 0 | Bark Type: D | # Callused Wounds: 1

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

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

Competing Species

Tree 5

Tree #: 50 | Zone: 18 | Easting: 426619 | Northing: 5023680

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

2 | Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems: 1 | DBH(cm): 11

Butternut Origin: Natural | Planted | Unknown

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

Assess below live crown: #Epic-Live: 0 | #Epic-Dead: 0 | Bark Type: D | # Callused Wounds: 2

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

Surveyor Last Name | Date (dd/mm/yyyy): 29 - 05 - 2018

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

Tree # 51 | Zone 18 | Easting 426617 | Northing 5023686

Crown Class | Live Crown %: 100 | Main Stem Length(m) Below crown: 1 | Seed Signs

2 | Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems: 2 | DBH(cm): 12

Butternut Origin: Natural | Planted | Unknown

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

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

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

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

Competing Species

Tree # 52 | Zone 18 | Easting 426616 | Northing 5023688

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

2 | Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems: 1 | DBH(cm): 10

Butternut Origin: Natural | Planted | Unknown

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

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

Tree # 53 | Zone 18 | Easting 426615 | Northing 5023695

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

2 | Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems: 1 | DBH(cm): 4

Butternut Origin: Natural | Planted | Unknown

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

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

Tree # 54 | Zone 18 | Easting 426616 | Northing 5023698

Crown Class | Live Crown %: 70 | Main Stem Length(m) Below crown: | Seed Signs

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

Butternut Origin: Natural | Planted | Unknown

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

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

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

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

Competing Species

Tree # 55 | Zone 18 | Easting 426612 | Northing 5023693

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

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

Butternut Origin: Natural | Planted | Unknown

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

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

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Surveyor Last Name

Date (dd/mm/yyyy) 29 - 05 - 2018

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

Tree # 56 | Zone 18 | Easting 426605 | Northing 5023690

Crown Class | Live Crown % 90 | Main Stem Length(m) Below crown 1 | Seed Signs

2 | ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | 1 #Stems | DBH(cm) 1 | Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown | Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown: 0 #Epic-Live; 0 #Epic-Dead; D 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 # 57 | Zone 18 | Easting 426609 | Northing 5023689

Crown Class | Live Crown % 100 | Main Stem Length(m) Below crown 1 | Seed Signs

2 | ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | 1 #Stems | DBH(cm) 4 | Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown | Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown: 0 #Epic-Live; 0 #Epic-Dead; D 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 # 58 | Zone 18 | Easting 426609 | Northing 5023689

Crown Class | Live Crown % 100 | Main Stem Length(m) Below crown 1 | Seed Signs

2 | ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | 1 #Stems | DBH(cm) 2 | Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown | Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown: 0 #Epic-Live; 0 #Epic-Dead; D 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 # 59 | Zone 18 | Easting 426607 | Northing 5023692

Crown Class | Live Crown % 70 | Main Stem Length(m) Below crown 1 | Seed Signs

2 | ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | 1 #Stems | DBH(cm) 3 | Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown | Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown: 0 #Epic-Live; 0 #Epic-Dead; D Bark Type; 6 # Callused Wounds

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

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

Competing Species

Tree # 60 | Zone 18 | Easting 426602 | Northing 5023684

Crown Class | Live Crown % 100 | Main Stem Length(m) Below crown 1 | Seed Signs

2 | ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | 1 #Stems | DBH(cm) 5 | Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown | Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown: 0 #Epic-Live; 0 #Epic-Dead; D Bark Type; 1 # Callused Wounds

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

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

Competing Species

Mechanical damage on Stem

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Surveyor Last Name

Date (dd/mm/yyyy): 29 - 05 - 2018

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

Tree # 61 | Zone 18 | Easting 426606 | Northing 5023687

Crown Class | Live Crown %: 100 | Main Stem Length(m) Below crown: 1

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

Butternut Origin: Natural | Planted | Unknown

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

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

Tree # 62 | Zone 18 | Easting 426602 | Northing 5023681

Crown Class | Live Crown %: 100 | Main Stem Length(m) Below crown: 1

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

Butternut Origin: Natural | Planted | Unknown

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

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

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

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

Competing Species:

Tree # 63 | Zone 18 | Easting 426609 | Northing 5023680

Crown Class | Live Crown %: 100 | Main Stem Length(m) Below crown: 1

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

Butternut Origin: Natural | Planted | Unknown

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

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

Tree # 64 | Zone 18 | Easting 426609 | Northing 5023679

Crown Class | Live Crown %: 100 | Main Stem Length(m) Below crown: 1

2 | 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: 0 | #Epic-Dead: 0 | Bark Type: D | # 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:

Tree # 65 | Zone 18 | Easting 426614 | Northing 5023680

Crown Class | Live Crown %: 100 | Main Stem Length(m) Below crown: 1

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

Butternut Origin: Natural | Planted | Unknown

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

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

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

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

Competing Species:

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Surveyor Last Name

Date (dd/mm/yyyy): 29 - 05 - 2018

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

Tree #: 66 | Zone: 18 | Easting: 426616 | Northing: 5023673

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

2 | Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems: 1 | DBH(cm): 5

Butternut Origin: Natural / Planted / Unknown

Male Flowers | Female Flowers | Seed Set | None

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

Tree #: 67 | Zone: 18 | Easting: 426620 | Northing: 5023675

Crown Class | Live Crown %: 70 | Main Stem Length(m) Below crown | Seed Signs

2 | Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems: 4 | DBH(cm): 2

Butternut Origin: Natural / Planted / Unknown

Male Flowers | Female Flowers | Seed Set | None

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

Coppice

Tree #: 68 | Zone: 18 | Easting: 426614 | Northing: 5023673

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

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

Butternut Origin: Natural / Planted / Unknown

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 #: 69 | Zone: 18 | Easting: 426613 | Northing: 5023673

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

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

Butternut Origin: Natural / Planted / Unknown

Male Flowers | Female Flowers | Seed Set | None

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

marked weed nearby

Tree #: 70 | Zone: 18 | Easting: 426607 | Northing: 5023670

Crown Class | Live Crown %: 70 | Main Stem Length(m) Below crown | Seed Signs

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

Butternut Origin: Natural / Planted / Unknown

Male Flowers | Female Flowers | Seed Set | None

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

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Surveyor Last Name

Date (dd/mm/yyyy) 29 - 05 - 2018

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

Tree # 71 | Zone 18 | Easting 426606 | Northing 5023675

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

2 | ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | 2 #Stems | 10 DBH(cm)

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

Assess below live crown: 0 #Epic-Live; 0 #Epic-Dead; D Bark Type; 1 # 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 # 72 | Zone 18 | Easting 426605 | Northing 5023667

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

2 | ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | 2 #Stems | 3 DBH(cm)

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

Assess below live crown: 0 #Epic-Live; 0 #Epic-Dead; D 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

Deer rub on stem

Tree # 73 | Zone 18 | Easting 426599 | Northing 5023666

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

2 | ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | 1 #Stems | 7 DBH(cm)

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

Assess below live crown: 0 #Epic-Live; 0 #Epic-Dead; D 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 # 74 | Zone 18 | Easting 426608 | Northing 5023668

Crown Class | Live Crown % 100 | Main Stem Length(m) Below crown 1

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

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

Assess below live crown: 0 #Epic-Live; 0 #Epic-Dead; D 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 # 75 | Zone 18 | Easting 426613 | Northing 5023664

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

2 | ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | 2 #Stems | 13 DBH(cm)

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

Assess below live crown: 0 #Epic-Live; 0 #Epic-Dead; D 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

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

Tree # 76

Zone 18 | Easting 426609 | Northing 5023662

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

2 | Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 4

Butternut Origin: Natural | Planted | Unknown

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

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

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

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

Competing Species

Deer rub on stem

Tree # 77

Zone 18 | Easting 426615 | Northing 5023665

Crown Class | Live Crown % 100 | Main Stem Length(m) Below crown 1

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

Butternut Origin: Natural | Planted | Unknown

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

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

Tree # 78

Zone 18 | Easting 426624 | Northing 5023663

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

1 | Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 5

Butternut Origin: Natural | Planted | Unknown

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

Assess below live crown: #Epic-Live 0 | #Epic-Dead 0 | Bark Type D | # Callused Wounds 2

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

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

Competing Species

Tree # 79

Zone 18 | Easting 426628 | Northing 5023656

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

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

Butternut Origin: Natural | Planted | Unknown

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

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

Tree # 80

Zone 18 | Easting 426635 | Northing 5023657

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

3 | 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 0 | #Epic-Dead 0 | Bark Type D | # Callused Wounds 1

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

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

Competing Species

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Date (dd/mm/yyyy) 29 - 05 - 2018

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

Tree # 81 | Zone 18 | Easting 426634 | Northing 5023655

Crown Class | Live Crown % 90 | Main Stem Length(m) Below crown 1

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

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

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

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

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

Competing Species

Tree # 82 | Zone 18 | Easting 426644 | Northing 5023655

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

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems 1 | DBH(cm) 14

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

Assess below live crown: #Epic-Live 0 | #Epic-Dead 0 | Bark Type D | # Callused Wounds 1

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

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

Competing Species

Tree # 83 | Zone 18 | Easting 426643 | Northing 5023668

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

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems 1 | DBH(cm) 12

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

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

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

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

Competing Species

Tree # 84 | Zone 18 | Easting 426626 | Northing 5023637

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

☐ 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 0 | #Epic-Dead 0 | Bark Type D | # Callused Wounds 2

	#Open	#Sooty
Root	1	6
=<2m	0	9
>2m	0	0

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

Competing Species

Tree # 85 | Zone 18 | Easting 426633 | Northing 5023639

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

☐ 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 0 | #Epic-Dead 0 | Bark Type D | # Callused Wounds 7

	#Open	#Sooty
Root	0	4
=<2m	0	9
>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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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) 29 - 05 - 2018

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

Tree # 86 | Zone 18 | Easting 426630 | Northing 5023646

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

3

- [ ] 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 1 | #Epic-Dead 0 | Bark Type D | # Callused Wounds 10

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

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

Competing Species

Tree # 87 | Zone 18 | Easting 426629 | Northing 5023639

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

1

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

#Stems 1 | DBH(cm) 16

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

Heavily cankered

Tree # 88 | Zone 18 | Easting 426623 | Northing 5023643

Crown Class | Live Crown % 90 | Main Stem Length(m) Below crown 6 | Seed Signs

1

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

#Stems 1 | DBH(cm) 17

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

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

Assess below live crown: #Epic-Live 0 | #Epic-Dead 1 | Bark Type D | # Callused Wounds 2

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

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

Competing Species

Tree # 89 | Zone 18 | Easting 426611 | Northing 5023655

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

2

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

#Stems 1 | DBH(cm) 10

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

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

Assess below live crown: #Epic-Live 0 | #Epic-Dead 0 | Bark Type D | # Callused Wounds 1

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

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

Competing Species

Dead rots on stem

Tree # 90 | Zone 18 | Easting 426607 | Northing 5023656

Crown Class | Live Crown % 90 | Main Stem Length(m) Below crown 1 | Seed Signs

1

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

#Stems 1 | DBH(cm) 2

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

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

Assess below live crown: #Epic-Live 0 | #Epic-Dead 0 | Bark Type D | # Callused Wounds 3

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

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

Competing Species

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Date (dd/mm/yyyy) 29 - 05 - 2018

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

Tree # 91 | Zone 18 | Easting 426596 | Northing 5023655

Crown Class | Live Crown % 100 | Main Stem Length(m) Below crown 1

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

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

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

Tree # 92 | Zone 18 | Easting 426591 | Northing 5023647

Crown Class | Live Crown % 100 | Main Stem Length(m) Below crown 1

2 ☐ 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 0 | #Epic-Dead 0 | Bark Type D | # 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

Tree # 93 | Zone 18 | Easting 426576 | Northing 5023638

Crown Class | Live Crown % 95 | Main Stem Length(m) Below crown 3

2 ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems 1 | DBH(cm) 13

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

Assess below live crown: #Epic-Live 0 | #Epic-Dead 0 | Bark Type D | # Callused Wounds 3

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

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

Competing Species

Tree # 94 | Zone 18 | Easting 426579 | Northing 5023635

Crown Class | Live Crown % 100 | Main Stem Length(m) Below crown 1

2 ☐ 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 0 | #Epic-Dead 0 | Bark Type D | # 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

Marked stick nearby

Tree # 95 | Zone 18 | Easting 426581 | Northing 5023636

Crown Class | Live Crown % 100 | Main Stem Length(m) Below crown 1

2 ☐ 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 0 | #Epic-Dead 0 | Bark Type D | # 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

Marked stick beside seedling

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Surveyor Last Name

Date (dd/mm/yyyy) 29 - 05 - 2018

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

Tree # 96 | Zone 18 | Easting 426570 | Northing 5023618

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

2 ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | 2 #Stems | DBH(cm) 27

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

Assess below live crown: 0 #Epic-Live; 0 #Epic-Dead; D 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 # 97 | Zone 18 | Easting 426568 | Northing 5023613

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

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

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

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

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

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

Competing Species:

Deer rub on stem

Tree # 98 | Zone 18 | Easting 426567 | Northing 5023621

Crown Class | Live Crown % 95 | Main Stem Length(m) Below crown 3

2 ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | 1 #Stems | DBH(cm) 10

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

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

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

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

Competing Species:

Deer rub on stem

Tree # 99 | Zone 18 | Easting 426567 | Northing 5023624

Crown Class | Live Crown % 100 | Main Stem Length(m) Below crown 1

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

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

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

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

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

Competing Species:

Tree # 100 | Zone 18 | Easting 426581 | Northing 5023625

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

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

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

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

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

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

Competing Species:

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Surveyor ID or BHA #: 002

Surveyor Last Name:

Date (dd/mm/yyyy): 29-05-2018

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

1

Tree #	Zone	Easting	Northing
101	18	426628	5023623

Field	Value
Crown Class	
Live Crown %	40
Main Stem Length(m) Below crown	
☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration	
#Stems	2
DBH(cm)	28
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:

1

Tree #	Zone	Easting	Northing
102	18	426617	5023610

Field	Value
Crown Class	
Live Crown %	60
Main Stem Length(m) Below crown	4
☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration	
#Stems	1
DBH(cm)	62
Butternut Origin	☐ Natural ☐ Planted ☐ Unknown
Seed Signs	☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown

#Epic-Live	0
#Epic-Dead	0
Bark Type	D
# Callused Wounds	0

	#Open	#Sooty
Root	1	1
=<2m	0	8
>2m	0	2

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

Competing Species:

Large Bn in backyard of brick house - hazard tree.

3

Tree #	Zone	Easting	Northing
103	18	426603	5023620

Field	Value
Crown Class	
Live Crown %	95
Main Stem Length(m) Below crown	6
☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration	
#Stems	1
DBH(cm)	43
Butternut Origin	☐ Natural ☐ Planted ☐ Unknown
Seed Signs	☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown

#Epic-Live	0
#Epic-Dead	0
Bark Type	D
# Callused Wounds	6

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

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

Competing Species:

1

Tree #	Zone	Easting	Northing
104	18	426547	5023582

Field	Value
Crown Class	
Live Crown %	95
Main Stem Length(m) Below crown	2
☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration	
#Stems	1
DBH(cm)	14
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	4
=<2m	0	6
>2m	0	0

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

Competing Species:

2

Tree #	Zone	Easting	Northing
105	18	426512	5023657

Field	Value
Crown Class	
Live Crown %	95
Main Stem Length(m) Below crown	2
☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration	
#Stems	2
DBH(cm)	3
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	0
=<2m	0	0
>2m	0	0

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

Competing Species:

Deer rub on 1 stem

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Surveyor Last Name

Date (dd/mm/yyyy) 20 - 06 - 2018

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

Tree 106

Tree # 106 | Zone 18 | Easting 426511 | Northing 5023656

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 2 | DBH(cm) 8

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

Deer rub on stem

Tree 107

Tree # 107 | Zone 18 | Easting 426497 | Northing 5023660

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

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

Tree 108

Tree # 108 | Zone 18 | Easting 426494 | Northing 5023661

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 4

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

Tree 109

Tree # 109 | Zone 18 | Easting 426490 | Northing 5023656

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

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

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

Tree 110

Tree # 110 | Zone 18 | Easting 426485 | Northing 5023652

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

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

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

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Date (dd/mm/yyyy) 20 - 06 - 2018

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

Tree # 111

Zone 18 | Easting 426427 | Northing 5023595

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

2 ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems 2 | DBH(cm) 4

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

Seed Signs: ☐ 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 # 112

Zone 18 | Easting 426540 | Northing 5023622

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

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

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

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

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

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

Competing Species

Deer rub on stem

Tree # 113

Zone 18 | Easting 426528 | Northing 5023657

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

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

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

Seed Signs: ☐ 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 # 114

Zone 18 | Easting 426551 | Northing 5023633

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

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems 2 | DBH(cm) 37

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

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

	#Open	#Sooty
Root	0	2
=<2m	0	11
>2m	0	0

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

Competing Species

Tree # 115

Zone 18 | Easting 426548 | Northing 5023631

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

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems 1 | DBH(cm) 12

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

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

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

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

Competing Species

Deer rub on stem

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Surveyor Last Name

Date (dd/mm/yyyy) 20-06-2018

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

Tree # 116

Zone 18 | Easting 426545 | Northing 5023652

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

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

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	0	0
=<2m	1	3
>2m	0	0

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

Competing Species

Tree # 117

Zone 18 | Easting 426545 | Northing 5023652

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

2 | ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems 1 | DBH(cm) 5

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	0
=<2m	0	1
>2m	0	0

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

Competing Species

Deer rub on stem

Tree # 118

Zone 18 | Easting 426543 | Northing 5023648

Crown Class | Live Crown % 100 | Main Stem Length(m) Below crown 1

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

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	0
=<2m	0	0
>2m	0	0

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

Competing Species

Tree # 119

Zone 18 | Easting 426552 | Northing 5023653

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

2 | ☐ 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: #Epic-Live | #Epic-Dead | Bark Type | # Callused Wounds 2

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

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

Competing Species

Deer rub on stem

Tree # 120

Zone 18 | Easting 426538 | Northing 5023654

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

2 | ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems 1 | DBH(cm) 9

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	0
=<2m	0	3
>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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Shaded fields are mandatory for Butternut Health Assessments

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): 20 - 06 - 2018

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

Tree #: 121 | Zone: 18 | Easting: 426542 | Northing: 5023656

Crown Class | Live Crown %: 100 | Main Stem Length(m) Below crown: 1

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems: 2 | DBH(cm): 3

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	0
=<2m	1	1
>2m	0	0

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

Competing Species

Tree #: 122 | Zone: 18 | Easting: 426535 | Northing: 5023657

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems: 1 | DBH(cm): 4

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

Tree #: 123 | Zone: 18 | Easting: 426544 | Northing: 5023658

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems: 1 | DBH(cm): 9

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

Beaver cut Ash down onto this Bn. Will likely resprout from base

---

Tree #: 124 | Zone: 18 | Easting: 426535 | Northing: 5023665

Crown Class | Live Crown %: 100 | Main Stem Length(m) Below crown: 1

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems: 3 | 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

Beaver cut Bn down. Bn suckering back up.

Tree #: 125 | Zone: 18 | Easting: 426532 | Northing: 5023665

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems: 1 | DBH(cm): 4

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	0
=<2m	0	0
>2m	0	0

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

Competing Species

Deer rub on stem

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

Surveyor Last Name

Date (dd/mm/yyyy) 20 - 06 - 2018

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

Tree # 126 | Zone 18 | Easting 426535 | Northing 5023671

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

2

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration

#Stems 1 | DBH(cm) 4

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	1
>2m	0	0

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

Competing Species

Tree # 127 | Zone 18 | Easting 426541 | Northing 5023665

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

2

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration

#Stems 1 | DBH(cm) 5

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

Tree # 128 | Zone 18 | Easting 426540 | Northing 5023596

Crown Class | Live Crown % 100 | Main Stem Length(m) Below crown 1

2

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration

#Stems 2 | DBH(cm) 2

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

Tree # 129 | Zone 18 | Easting 426549 | Northing 5023599

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

2

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration

#Stems 1 | DBH(cm) 2

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

Tree # 130 | Zone 18 | Easting 426556 | Northing 5023601

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

1

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration

#Stems 1 | DBH(cm) 3

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	0	0
=<2m	1	0
>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

Surveyor Last Name

Date (dd/mm/yyyy) 20-06-2018

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

Tree # 131

Zone 18 | Easting 426563 | Northing 5023592

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 2 | DBH(cm) 5

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	3
>2m	6	0

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

Competing Species

Tree # 132

Zone 18 | Easting 426557 | Northing 5023592

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

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

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

Tree # 133

Zone 18 | Easting 426569 | Northing 5023567

Crown Class | Live Crown % 100 | Main Stem Length(m) Below crown 1

2 | 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

Tree # 134

Zone 18 | Easting 426813 | Northing 5023526

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

2 | Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 2 | DBH(cm) 8

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	1
>2m	0	0

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

Competing Species

In dead ash trees

Tree # 135

Zone 18 | Easting 426809 | Northing 5023525

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

2 | 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: #Epic-Live | #Epic-Dead | Bark Type | # Callused Wounds 1

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

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

Competing Species

In dead ash trees

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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): 20-06-2018

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

Tree #: 136 | Zone: 18 | Easting: 426794 | Northing: 5623601

Crown Class | Live Crown %: 100 | Main Stem Length(m) Below crown: 3 | Seed Signs: None

2 | Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems: 1 | DBH(cm): 7

Butternut Origin: Unknown

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

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

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

Competing Species

Tree #: 137 | Zone: 18 | Easting: 426737 | Northing: 5023659

Crown Class | Live Crown %: 100 | Main Stem Length(m) Below crown: 2 | Seed Signs: None

2 | Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems: 1 | DBH(cm): 7

Butternut Origin: Unknown

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

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

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

Competing Species

Tree #: 138 | Zone: 18 | Easting: 426989 | Northing: 5023869

Crown Class | Live Crown %: 100 | Main Stem Length(m) Below crown: 2 | Seed Signs: None

3 | Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems: 1 | DBH(cm): 23

Butternut Origin: Unknown

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

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

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

Competing Species

Archivable

Tree #: 139 | Zone: 18 | Easting: 426980 | Northing: 5023873

Crown Class | Live Crown %: 95 | Main Stem Length(m) Below crown: 3 | Seed Signs: None

1 | Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems: 1 | DBH(cm): 14

Butternut Origin: Unknown

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

	#Open	#Sooty
Root	1	3
=<2m	6	7
>2m	3	1

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

Competing Species

Tree #: 140 | Zone: 18 | Easting: 426973 | Northing: 5023868

Crown Class | Live Crown %: 90 | Main Stem Length(m) Below crown: 2 | Seed Signs: None

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

Butternut Origin: Unknown

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

	#Open	#Sooty
Root	2	2
=<2m	5	3
>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) 20-06-2018

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

Tree 141

Tree # 141 | Zone 18 | Easting 426970 | Northing 5023867

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 4

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	0	2
=<2m	2	3
>2m	1	1

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

Competing Species

Tree 142

Tree # 142 | Zone 18 | Easting 426968 | Northing 5023863

Crown Class | Live Crown % 70 | Main Stem Length(m) Below crown 3

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 4

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	2	0
=<2m	2	4
>2m	0	0

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

Competing Species

Tree 143

Tree # 143 | Zone 18 | Easting 426963 | Northing 5023861

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 4

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 144

Tree # 144 | Zone 18 | Easting 426928 | Northing 5023836

Crown Class | Live Crown % 80 | Main Stem Length(m) Below crown 5

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 11

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	1	1
=<2m	2	3
>2m	1	0

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

Competing Species

Tree 145

Tree # 145 | Zone 18 | Easting 427079 | Northing 5024464

Crown Class | Live Crown % 95 | Main Stem Length(m) Below crown 16

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: #Epic-Live | #Epic-Dead | Bark Type | # Callused Wounds 12

	#Open	#Sooty
Root	3	4
=<2m	2	1
>2m	5	3

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 # 062

Surveyor Last Name

Date (dd/mm/yyyy) 20-06-2018

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

Tree # 146

Zone 18 | Easting 427091 | Northing 5024445

Crown Class 2 | Live Crown % 100 | Main Stem Length(m) Below crown 1

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

Tree # 147

Zone 18 | Easting 427065 | Northing 5024418

Crown Class 1 | Live Crown % 0 | Main Stem Length(m) Below crown

Twig Dieback | Branch Dieback | Defoliation | Discolouration

#Stems 1 | DBH(cm) 43

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 # 148

Zone 18 | Easting 427076 | Northing 5024412

Crown Class 1 | Live Crown % 30 | Main Stem Length(m) Below crown

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 # 149

Zone 18 | Easting 427081 | Northing 5024464

Crown Class 1 | Live Crown % 30 | Main Stem Length(m) Below crown

Twig Dieback | Branch Dieback | Defoliation | Discolouration

#Stems 1 | DBH(cm) 24

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 # 150

Zone 18 | Easting 426968 | Northing 5023861

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration

#Stems 1 | DBH(cm) 19

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	0	0
=<2m	2	1
>2m	0	0

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

Competing Species

Please enter matching page link code on forms 1 and 2

Page Link 426657

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Butternut Data Collection FORM 2 (2010 Edition)

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Shaded fields are mandatory for Butternut Health Assessments

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): 26 - 06 - 2018

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

Tree # 151

Zone: 18 | Easting: 426991 | Northing: 5023880

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

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: #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

Tree # 152

Zone: 18 | Easting: 426990 | Northing: 5023879

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems: 2 | DBH(cm): 8

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	0

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

Competing Species

Tree # 153

Zone: 18 | Easting: 426992 | Northing: 5023882

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems: 1 | DBH(cm): 9

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	0	3
=<2m	5	3
>2m	0	0

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

Competing Species

Tree # 154

Zone: 18 | Easting: 427000 | Northing: 5032889

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems: 1 | DBH(cm): 13

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	0	0
=<2m	3	5
>2m	2	1

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

Competing Species

Tree # 155

Zone: 18 | Easting: 427038 | Northing: 5023930

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

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

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

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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) 20 - 06 - 2018

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

Tree # 156 | Zone 18 | Easting 427215 | Northing 5023898

Crown Class | Live Crown % 100 | Main Stem Length(m) Below crown 1

2 | ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | 2 #Stems | 4 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 | 0 # Callused Wounds

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

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

Competing Species

On RR property - W side

Tree # 157 | Zone 18 | Easting 427214 | Northing 5023899

Crown Class | Live Crown % 100 | Main Stem Length(m) Below crown 1

2 | ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | 1 #Stems | 5 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 | 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

Close to Tree #156

Tree # 158 | Zone 18 | Easting 426446 | Northing 5023775

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

2 | ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | 1 #Stems | 20 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 | 0 # Callused Wounds

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

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

Competing Species

Tree # 159 | Zone 18 | Easting 426428 | Northing 5023775

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

2 | ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | 1 #Stems | 3 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 | 1 # 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 # 160 | Zone 18 | Easting 426459 | Northing 5023819

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

2 | ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | 2 #Stems | 14 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 | 3 # Callused Wounds

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

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

Competing Species

Deer rub on stems.

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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) 22-06-2018

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

Tree # 161 | Zone 18 | Easting 426466 | Northing 5023823

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 9

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

Tree # 162 | Zone 18 | Easting 426577 | Northing 5024074

Crown Class | Live Crown % 30 | Main Stem Length(m) Below crown

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 41

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		
=<2m		
>2m		1

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

Competing Species

Tree # 163 | Zone 18 | Easting 426593 | Northing 5024056

Crown Class | Live Crown % 90 | Main Stem Length(m) Below crown 6

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 2 | DBH(cm) 72

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	9
=<2m	3	11
>2m	2	12

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

Competing Species

Tree # 164 | Zone 18 | Easting 426586 | Northing 5024042

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 2 | DBH(cm) 15

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	4
=<2m	3	2
>2m	0	0

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

Competing Species

Tree # 165 | Zone 18 | Easting 426600 | Northing 5024024

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 2 | DBH(cm) 8

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	1	2
=<2m	1	3
>2m	0	0

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

Competing Species

Deer rub on stem

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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 # 402

Surveyor Last Name

Date (dd/mm/yyyy) 22-06-2015

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

Tree # 166 | Zone 18 | Easting 426720 | Northing 5023848

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

2

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration

#Stems 2 | 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 0

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

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

Competing Species

Tree # 167 | Zone 18 | Easting 426797 | Northing 5023860

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

1

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration

#Stems 2 | DBH(cm) 2

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	0	0
=<2m	1	1
>2m	0	0

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

Competing Species

Tree # 168 | Zone 18 | Easting 426685 | Northing 5023964

Crown Class | Live Crown % 60 | Main Stem Length(m) Below crown 9

1

☐ 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: #Epic-Live | #Epic-Dead | Bark Type | # Callused Wounds 8

	#Open	#Sooty
Root	5	1
=<2m	8	5
>2m	2	4

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

Competing Species

Tree # 169 | Zone 18 | Easting 426693 | Northing 5023945

Crown Class | Live Crown % 70 | Main Stem Length(m) Below crown 7

3

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration

#Stems 1 | DBH(cm) 39

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	1
=<2m	0	0
>2m	0	0

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

Competing Species

Tree # 170 | Zone 18 | Easting 426699 | Northing 5023939

Crown Class | Live Crown % 30 | Main Stem Length(m) Below crown

1

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration

#Stems 1 | DBH(cm) 18

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

Surveyor Last Name

Date (dd/mm/yyyy) 22-06-2018

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

Tree # 171

Zone 18 | Easting 426633 | Northing 5023973

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 2 | 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 3

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

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

Competing Species

Deer rub on stems

Tree # 172

Zone 18 | Easting 426619 | Northing 5024013

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 23

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	2	0
=<2m	0	10
>2m	0	0

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

Competing Species

Tree # 173

Zone 18 | Easting 426620 | Northing 5024039

Crown Class | Live Crown % 0 | Main Stem Length(m) Below crown 6

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 2 | DBH(cm) 39

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	0	5
=<2m	3	4
>2m		

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

Competing Species

Tree # 174

Zone 18 | Easting 426616 | Northing 5024022

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 16

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

Could not get to tree - assessed @ approx. 3m away.

Tree # 175

Zone 18 | Easting 426601 | Northing 5024061

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 2 | DBH(cm) 62

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 21

	#Open	#Sooty
Root	0	10
=<2m	0	12
>2m	0	5

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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Shaded fields are mandatory for Butternut Health Assessments

Site Code(A,B,...Z, AA...) | Surveyor ID or BHA # 1002

Surveyor Last Name

Date (dd/mm/yyyy) 25 - 06 - 2018

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

Tree # 176 | Zone 18 | Easting 426745 | Northing 5023905

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

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

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	1
>2m	0	0

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

Competing Species

Tree # 177 | Zone 18 | Easting 426910 | Northing 5024212

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

2 ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems 2 | DBH(cm) 5

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	10
=<2m	0	0
>2m	0	0

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

Competing Species

Tree # 178 | Zone 18 | Easting 426963 | Northing 5024073

Crown Class | Live Crown % 100 | Main Stem Length(m) Below crown 1

2 ☐ 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

Tree # 179 | Zone 18 | Easting 426965 | Northing 5023869

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

2 ☐ 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: #Epic-Live | #Epic-Dead | Bark Type | # Callused Wounds 1

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

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

Competing Species

Deer rub in stem

Tree # 180 | Zone 18 | Easting 426954 | Northing 5023867

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

1 ☐ 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: #Epic-Live | #Epic-Dead | Bark Type | # Callused Wounds 4

	#Open	#Sooty
Root	0	0
=<2m	2	1
>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 # 062

Surveyor Last Name

Date (dd/mm/yyyy) 28-06-2018

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

Tree # 181 | Zone 18 | Easting 427076 | Northing 5024400

Crown Class | Live Crown % 100 | Main Stem Length(m) Below crown 1

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

Tree # 182 | Zone 18 | Easting 427044 | Northing 5024365

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 85

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	4
=<2m	3	5
>2m	1	1

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

Competing Species

Tree # 183 | Zone 18 | Easting 427044 | Northing 5024359

Crown Class | Live Crown % 30 | Main Stem Length(m) Below crown

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

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

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

Competing Species

Tree # 184 | Zone 18 | Easting 427046 | Northing 5024366

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 58

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 # 185 | Zone 18 | Easting 427028 | Northing 5024359

Crown Class | Live Crown % 75 | Main Stem Length(m) Below crown 10

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 51

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	2
=<2m	0	3
>2m	1	1

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# 062

Surveyor Last Name

Date (dd/mm/yyyy) 28 - 06 - 2018

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

Tree # 186 | Zone 18 | Easting 427029 | Northing 5024356

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

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration

#Stems 1 | DBH(cm) 53

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 # 187 | Zone 18 | Easting 427013 | Northing 5024376

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

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration

#Stems 1 | DBH(cm) 70

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 # 188 | Zone 18 | Easting 427007 | Northing 5024359

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

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration

#Stems 1 | DBH(cm) 43

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 # 189 | Zone 18 | Easting 426991 | Northing 5024340

Crown Class | Live Crown % 30 | Main Stem Length(m) Below crown

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration

#Stems 1 | 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

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

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

Competing Species

Tree # 190 | Zone 18 | Easting 427000 | Northing 5024341

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

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration

#Stems 1 | 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

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

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) 28 - 06 - 2018

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

Tree # 191 | Zone 18 | Easting 427005 | Northing 5024337

Crown Class | Live Crown % 20 | Main Stem Length(m) Below crown | Seed Signs

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

#Stems 1 | DBH(cm) 42

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 # 192 | Zone 18 | Easting 427027 | Northing 5024340

Crown Class | Live Crown % 75 | Main Stem Length(m) Below crown 11 | Seed Signs

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

#Stems 1 | DBH(cm) 39

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

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

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

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

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

Competing Species

Tree # 193 | Zone 18 | Easting 427011 | Northing 5024326

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

- [ ] 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 | 6 # Callused Wounds

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

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

Competing Species

Tree # 194 | Zone 18 | Easting 426978 | Northing 5024327

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

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

#Stems 1 | DBH(cm) 49

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 # 195 | Zone 18 | Easting 426980 | Northing 5024313

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

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

#Stems 1 | DBH(cm) 42

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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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) 28 - 06 - 2018

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

Tree # 196 | Zone 18 | Easting 426945 | Northing 5024325

Crown Class | Live Crown % 40 | Main Stem Length(m) Below crown 10

1 ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems 1 | DBH(cm) 65

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		
=<2m		
>2m		

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

Competing Species

Tree # 197 | Zone 18 | Easting 426935 | Northing 5024335

Crown Class | Live Crown % 80 | Main Stem Length(m) Below crown 12

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

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	3	3
=<2m	9	4
>2m	1	1

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

Competing Species

Tree # 198 | Zone 18 | Easting 426917 | Northing 5024311

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

3 ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems 1 | DBH(cm) 67

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	0	6
=<2m	2	1 1
>2m	0	2

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

Competing Species

Tree # 199 | Zone 18 | Easting 426926 | Northing 5024305

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

1 ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems 1 | DBH(cm) 49

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 # 200 | Zone 18 | Easting 426935 | Northing 5024304

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

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

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

Surveyor Last Name

Date (dd/mm/yyyy) 25-06-2018

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

Tree # 201

Zone 18 | Easting 426920 | Northing 5024289

3

Crown Class | Live Crown % 75 | Main Stem Length(m) Below crown 8

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 53

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	4	3
=<2m	1	5
>2m	0	1

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

Competing Species

Tree # 202

Zone 18 | Easting 426922 | Northing 5024266

2

Crown Class | Live Crown % 80 | Main Stem Length(m) Below crown 2

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 52

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	2	1
=<2m	0	1
>2m	0	0

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

Competing Species

Tree # 203

Zone 18 | Easting 427115 | Northing 5024395

1

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 14

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 2

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

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

Competing Species

Tree # 204

Zone 18 | Easting 427029 | Northing 5024320

3

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 38

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 2

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

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

Competing Species

Tree # 205

Zone 18 | Easting 427014 | Northing 5024295

2

Crown Class | Live Crown % 100 | Main Stem Length(m) Below crown 1

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

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

Surveyor Last Name

Date (dd/mm/yyyy): 30 - 06 - 2018

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

Tree # 206

Zone 18 | Easting 427002 | Northing 5024302

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

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems: 1 | DBH(cm): 45

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 # 207

Zone 18 | Easting 426991 | Northing 5024301

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

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems: 1 | DBH(cm): 33

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 # 208

Zone 18 | Easting 426979 | Northing 5024300

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

☐ 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

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

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

Competing Species

Tree # 209

Zone 18 | Easting 426990 | Northing 5024286

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

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems: 1 | DBH(cm): 45

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 # 210

Zone 18 | Easting 426965 | Northing 5024283

Crown Class | Live Crown %: 0 | Main Stem Length(m) Below crown | 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: #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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Site Code(A,B,...Z, AA...) | Surveyor ID or BHA # 002

Surveyor Last Name

Date (dd/mm/yyyy) 30 - 06 - 2018

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

Tree # 211

Zone 18 | Easting 426939 | Northing 5024283

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | 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 # 212

Zone 18 | Easting 426946 | Northing 5024298

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 38

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 # 213

Zone 18 | Easting 426951 | Northing 5024283

Crown Class | Live Crown % 30 | Main Stem Length(m) Below crown

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 45

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 # 214

Zone 18 | Easting 426955 | Northing 5024271

Crown Class | Live Crown % 85 | Main Stem Length(m) Below crown 10

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 33

Butternut Origin: Natural | Planted | Unknown

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

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

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

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

Competing Species

Archivable

Tree # 215

Zone 18 | Easting 426951 | Northing 5024266

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

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

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

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

Competing Species

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Butternut Data Collection FORM 2 (2010 Edition)

(PLEASE USE BLOCK LETTERS)

Shaded fields are mandatory for Butternut Health Assessments

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) 30-06-2015

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

Tree # 216 | Zone 18 | Easting 426947 | Northing 5024271

2 | Crown Class | Live Crown % 100 | Main Stem Length(m) Below crown 1

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

Aged stick beside seedling

Tree # 217 | Zone 18 | Easting 426947 | Northing 5024269

2 | Crown Class | Live Crown % 100 | Main Stem Length(m) Below crown 1

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

Tree # 218 | Zone 18 | Easting 426947 | Northing 5024271

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration

#Stems 1 | DBH(cm) 37

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	6	1
=<2m	0	2
>2m	0	1

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

Competing Species

Archivable

Tree # 219 | Zone 18 | Easting 426936 | Northing 5024265

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration

#Stems 1 | DBH(cm) 30

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 # 220 | Zone 18 | Easting 426932 | Northing 5024271

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

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: #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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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) 30-06-2018

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

Tree # 216 | Zone 18 | Easting 426929 | Northing 5024273

Crown Class 1 | Live Crown % 30 | Main Stem Length(m) Below crown

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: #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 # 222 | Zone 18 | Easting 426949 | Northing 5024233

Crown Class 1 | Live Crown % 80 | Main Stem Length(m) Below crown 3

Twig Dieback | Branch Dieback | Defoliation | Discolouration

#Stems 1 | DBH(cm) 13

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	3	0
=<2m	4	4
>2m	1	0

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

Competing Species

Tree # 223 | Zone 18 | Easting 426937 | Northing 5024239

Crown Class 1 | Live Crown % 90 | Main Stem Length(m) Below crown

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

	#Open	#Sooty
Root	1	5
=<2m	0	6
>2m	1	4

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

Competing Species

Tree # 224 | Zone 18 | Easting 426932 | Northing 5024250

Crown Class 1 | Live Crown % 30 | Main Stem Length(m) Below crown

Twig Dieback | Branch Dieback | Defoliation | Discolouration

#Stems 1 | DBH(cm) 16

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	1	2
=<2m		
>2m		

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

Competing Species

Tree # 225 | Zone 18 | Easting 426880 | Northing 5024271

Crown Class 3 | Live Crown % 95 | Main Stem Length(m) Below crown 8

Twig Dieback | Branch Dieback | Defoliation | Discolouration

#Stems 1 | DBH(cm) 24

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	1	2
=<2m	2	3
>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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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) 30-06-2018

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

Tree # 226 | Zone 18 | Easting 426871 | Northing 5024271

Crown Class | Live Crown % 90 | Main Stem Length(m) Below crown 6

2 | ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems | DBH(cm) 16

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	2	0
=<2m	1	0
>2m	1	0

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

Competing Species

Tree # 227 | Zone 18 | Easting 426825 | Northing 5024319

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

1 | ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems 1 | DBH(cm) 28

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 # 228 | Zone 18 | Easting 426848 | Northing 5024374

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

3 | ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems 1 | DBH(cm) 71

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	2	8
=<2m	1	3
>2m	0	0

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

Competing Species

Possibly off property

Tree # 229 | Zone 18 | Easting 426858 | Northing 5024349

Crown Class | Live Crown % 80 | Main Stem Length(m) Below crown 9

3 | ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems 1 | DBH(cm) 38

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	2	0
=<2m	1	3
>2m	0	1

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

Competing Species

Tree # 236 | Zone 18 | Easting 426885 | Northing 5024330

Crown Class | Live Crown % 20 | Main Stem Length(m) Below crown

1 | ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems | DBH(cm) 29

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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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 # 102

Surveyor Last Name

Date (dd/mm/yyyy) 30-06-2018

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

Tree # 231

Zone 18 | Easting 426881 | Northing 5024352

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 45

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 # 232

Zone 18 | Easting 426876 | Northing 5024368

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 44

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 # 233

Zone 18 | Easting 426889 | Northing 5024421

Crown Class | Live Crown % 20 | Main Stem Length(m) Below crown

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 48

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 # 234

Zone 18 | Easting 426902 | Northing 5024410

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 51

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 # 235

Zone 18 | Easting 426961 | Northing 5024421

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 59

Butternut Origin: Natural | Planted | Unknown

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

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

	#Open	#Sooty
Root	4	1
=<2m	1	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) 30-06-2018

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

Tree # 236 | Zone 18 | Easting 426942 | Northing 5024441

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 44

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 # 237 | Zone 18 | Easting 427022 | Northing 5024514

Crown Class | Live Crown % 20 | Main Stem Length(m) Below crown | Seed Signs

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 42

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 # 238 | Zone 18 | Easting 427028 | Northing 5024517

Crown Class | Live Crown % 0 | Main Stem Length(m) Below crown | 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: #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 # 239 | Zone 18 | Easting 427050 | Northing 5024501

Crown Class | Live Crown % 75 | Main Stem Length(m) Below crown 9 | Seed Signs

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | DBH(cm) 44

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	0
=<2m	0	1
>2m	0	1

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

Competing Species

Tree # 240 | Zone 18 | Easting 427039 | Northing 5024504

Crown Class | Live Crown % 95 | Main Stem Length(m) Below crown 11 | Seed Signs

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

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 16

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

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

Competing Species

Archivable

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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) 30-06-2018

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

Tree # 241 | Zone 18 | Easting 427039 | Northing 5024488

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

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | 1 #Stems | 46 DBH(cm)

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown: #Epic-Live | #Epic-Dead | Bark Type | 12 # Callused Wounds

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

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

Competing Species

Tree # 242 | Zone 18 | Easting 427065 | Northing 5024489

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

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | 1 #Stems | 41 DBH(cm)

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

☐ 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 # 243 | Zone 18 | Easting 427061 | Northing 5024523

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

1 ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | 1 #Stems | 49 DBH(cm)

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

☐ 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 # 244 | Zone 18 | Easting 427102 | Northing 5024564

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

2 ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | 1 #Stems | 25 DBH(cm)

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

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

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

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 | Seed Signs

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

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

☐ 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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APPENDIX E

OMNRF Information Request Response

McKINLEY ENVIRONMENTAL SOLUTIONS
613-620-2255
mckinleyenvironmental@gmail.com
www.mckinleyenvironmental.com

Ministry of Natural Resources and Forestry

Kemptville District

10-1 Campus Drive
Kemptville ON K0G 1J0
Tel.: 613 258-8204
Fax: 613 258-3920

Ministère des Richesses naturelles et des Forêts

District de Kemptville

10-1, promenade Campus
Kemptville ON K0G 1J0
Tél.: 613 258-8204
Téléc.: 613 258-3920

Ontario

Thurs. Jun 28, 2018

Andrew McKinley
McKinley Environmental Solutions
PO Box 45505, 3151 Strandherd Dr.
Ottawa, Ontario
K2J 5N1
(613) 620-2255
mckinleyenvironmental@gmail.com

Attention: Andrew McKinley

Subject: Information Request - Developments
Project Name: 936 March Rd Environmental Impact Statement and Tree Conservation Report
Site Address: 936 March Rd, Ottawa, ON, K2K 1X7
Our File No. 2018_MAR-4471

Natural Heritage Values

The Ministry of Natural Resources and Forestry (MNRF) Kemptville District has carried out a preliminary review of the above mentioned area in order to identify any potential natural resource and natural heritage values.

The following Natural Heritage values were identified for the general subject area:

- Unevaluated Wetlands (Not evaluated per OWES)
- Stream (Shirley's Brook Tributary)

Municipal Official Plans contain information related to natural heritage features. Please see the local municipal Official Plan for more information, such as specific policies and direction pertaining to activities which may impact natural heritage features. For planning advice or Official Plan interpretation, please contact the local municipality. Many municipalities require environmental impact studies and other supporting studies be carried out as part of the development application process to allow the municipality to make planning decisions which are consistent with the Provincial Policy Statement (PPS, 2014).

The MNRF strongly encourages all proponents to contact partner agencies and appropriate municipalities early on in the planning process. This provides the proponent with early knowledge regarding agency requirements, authorizations and approval timelines; Ministry of the Environment

and Climate Change (MOECC) and the local Conservation Authority may require approvals and permitting where natural values and natural hazards (e.g., floodplains) exist.

As per the Natural Heritage Reference Manual (NHRM, 2010) the MNRF strongly recommends that an ecological site assessment be carried out to determine the presence of natural heritage features and species at risk and their habitat on site. The MNRF can provide survey methodology for particular species at risk and their habitats.

The NHRM also recommends that cumulative effects of development projects on the integrity of natural heritage features and areas be given due consideration. This includes the evaluation of the past, present and possible future impacts of development in the surrounding area that may occur as a result of demand created by the presently proposed project.

In addition, the fish community found at Shirley's Brook Tributary includes: blacknose shiner, brook stickleback, central mudminnow, creek chub, fathead minnow, finescale dace, northern redbelly dace, pearl dace, white sucker.

Wildland Fire

MNRF woodland data shows that the site contains woodlands. The lands should be assessed for the risk of wildland fire as per PPS 2014, Section 3.1.8 "*Development shall generally be directed to areas outside of lands that are unsafe for development due to the presence of hazardous forest types for wildland fire. Development may however be permitted in lands with hazardous forest types for wildland fire where the risk is mitigated in accordance with wildland fire assessment and mitigation standards".* Further discussion with the local municipality should be carried out to address how the risks associated with wildland fire will be covered for such a development proposal. Please see the Wildland Fire Risk Assessment and Mitigation Guidebook (2016) for more information.

Significant Woodlands

Section 2.1.5 b) of the PPS states: *Development and site alteration shall not be permitted in significant woodlands unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.* The 2014 PPS directs that significant woodlands must be identified following criteria established by the Ontario Ministry of Natural Resources and Forestry, i.e. the Natural Heritage Reference Manual (NHRM), 2010. Where the local or County Official Plan has not yet updated significant woodland mapping to reflect the 2014 PPS, all wooded areas should be reviewed on a site specific basis for significance. The MNRF Kemptville District modelled locations of significant woodlands in 2011 based on NHRM criteria. The presence of significant woodland on site or within 120 metres should trigger an assessment of the impacts to the feature and its function from the proposed development.

Significant Wildlife Habitat

Section 2.1.5 d) of the PPS states: *Development and site alteration shall not be permitted in significant wildlife habitat unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.* It is the responsibility of the approval authority to identify significant wildlife habitat or require its identification. The MNRF has several guiding documents which may be useful in identification of significant wildlife habitat and characterization of impacts and mitigation options:

- Significant Wildlife Habitat Technical Guide, 2000
- The Natural Heritage Reference Manual, 2010
- Significant Wildlife Habitat Mitigation Support Tool, 2014
- Significant Wildlife Habitat Criteria Schedule for Ecoregion 5E and 6E, 2015

The habitat of special concern species (as identified by the Species at Risk in Ontario list) and Natural Heritage Information Centre tracked species with a conservation status rank of S1, S2 and S3 may be significant wildlife habitat and should be assessed accordingly.

Species at Risk

A review of the Natural Heritage Information Centre (NHIC) and internal records indicate that there is a potential for the following threatened (THR) and/or endangered (END) species on the site or in proximity to it:

- Bank Swallow (THR)
- Barn Swallow (THR)
- Blanding's Turtle (THR)
- Bobolink (THR)
- Butternut (END)
- Eastern Meadowlark (THR)
- Little Brown Bat (END)

All endangered and threatened species receive individual protection under section 9 of the ESA and receive general habitat protection under Section 10 of the ESA, 2007. Thus any potential works should consider disturbance to the individuals as well as their habitat (e.g. nesting sites). General habitat protection applies to all threatened and endangered species. Note some species in Kemptville District receive regulated habitat protection. The habitat of these listed species is protected from damage and destruction and certain activities may require authorization(s) under the ESA. For more on how species at risk and their habitat is protected, please see: https://www.ontario.ca/page/how-species-risk-are-protected.

If the proposed activity is known to have an impact on any endangered or threatened species at risk (SAR), or their habitat, an authorization under the ESA may be required. It is recommended that MNRF Kemptville be contacted prior to any activities being carried out to discuss potential survey protocols to follow during the early planning stages of a project, as well as mitigation measures to avoid contravention of the ESA. Where there is potential for species at risk or their habitat on the property, an Information Gathering Form should be submitted to Kemptville MNRF at sar.kemptville@ontario.ca.

The Information Gathering Form may be found here:
http://www.forms.ssb.gov.on.ca/mbs/ssb/forms/ssbforms.nsf/FormDetail?OpenForm&ACT=RDR&TAB=PROFILE&ENV=WWE&NO=018-0180E

For more information on the ESA authorization process, please see:
https://www.ontario.ca/page/how-get-endangered-species-act-permit-or-authorization

One or more special concern species has been documented to occur either on the site or nearby. Species listed as special concern are not protected under the ESA, 2007. However, please note that some of these species may be protected under the Fish and Wildlife Conservation Act and/or Migratory Birds Convention Act. Again, the habitat of special concern species may be significant wildlife habitat and should be assessed accordingly. Species of special concern for consideration:

- Canada Warbler (SC)
- Monarch (SC)
- Peregrine Falcon (SC)
- Short-eared Owl (SC)
- Snapping Turtle (SC)
- Wood Thrush (SC)

If any of these or any other species at risk are discovered throughout the course of the work, and/or should any species at risk or their habitat be potentially impacted by on site activities, MNRF should be contacted and operations be modified to avoid any negative impacts to species at risk or their habitat until further direction is provided by MNRF.

Please note that information regarding species at risk is based largely on documented occurrences and does not necessarily include an interpretation of potential habitat within or in proximity to the site in question. Although this data represents the MNRF's best current available information, it is important to note that a lack of information for a site does not mean that additional features and values are not present. It is the responsibility of the proponent to ensure that species at risk are not killed, harmed, or harassed, and that their habitat is not damaged or destroyed through the activities carried out on the site.

The MNRF continues to strongly encourage ecological site assessments to determine the potential for SAR habitat and occurrences. When a SAR or potential habitat for a SAR does occur on a site, it is recommended that the proponent contact the MNRF for technical advice and to discuss what activities can occur without contravention of the Act. For specific questions regarding the Endangered Species Act (2007) or SAR, please contact MNRF Kemptville District at sar.kemptville@ontario.ca.

The approvals processes for a number of activities that have the potential to impact SAR or their habitat have recently changed. For information regarding regulatory exemptions and associated online registration of certain activities, please refer to the following website: https://www.ontario.ca/page/how-get-endangered-species-act-permit-or-authorization.

Please note: The advice in this letter may become invalid if:

- The Committee on the Status of Species at Risk in Ontario (COSSARO) re-assesses the status of the above-named species OR adds a species to the SARO List such that the section 9 and/or 10 protection provisions apply to those species; or
- Additional occurrences of species are discovered on or in proximity to the site.

This letter is valid until: Thu. Jun 27, 2019

The MNRF would like to request that we continue to be circulated on information with regards to this project. If you have any questions or require clarification please do not hesitate to contact me.

Sincerely,

Jane Devlin
Management Biologist
Jane.devlin@ontario.ca

Encl.\
-ESA Infosheet
-NHIC/LIO Infosheet

APPENDIX F

Letter Documenting Removal of Dead Ash Trees – Southern Hedgerows (MES 2018)

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By-Law and Regulatory Services
City of Ottawa
110 Laurier Avenue West
Ottawa, ON, K1P 1J1

June 7th, 2018

Attn: Zandra Charbonneau, Property Standards/Zoning Officer

Re: 2559688 Ontario Inc. Kanata North Development
Removal of Dead Ash Trees - Southern Hedgerow

1.0 INTRODUCTION AND BACKGROUND

McKinley Environmental Solutions (MES) has been retained by 2559688 Ontario Inc. (the Owner) with regards to the letter prepared by the City of Ottawa By-Law and Regulatory Services (Prepared by Zandra Charbonneau, Property Standards/Zoning Officer, dated May 8th, 2018), which identified the presence of dead ash trees along the southern boundary of the 936 March Road property. MES has also been retained by the Owner to undertake a Combined Environmental Impact Statement (EIS) and Tree Conservation Report (TCR) to support the proposed development of portions of the Southeast Quadrant of the Kanata North Urban Expansion Area (KNUEA) and adjacent rural lands. As shown in Figure 1, the scope of MES's assessment includes the property surrounding 936 March Road, which is within the urban area, and which was identified by the KNUEA Community Design Plan (CDP) as the Southeast Quadrant of the KNUEA. MES's assessment will also address the rural lands located to the east of the KNUEA Southeast Quadrant, which occur between the Former CN Railway Corridor and March Valley Road. In total, the scope of MES's Combined EIS and TCR will include approximately 82 ha of land, including all areas of the Southeast Quadrant of the KNUEA and the lands located to the east (within the rural area), portions of which are intended to be utilized to house stormwater management infrastructure. At the time of writing, the Combined EIS and TCR was ongoing. Ultimately, it is anticipated that the Combined EIS and TCR will be submitted to the City of Ottawa and other review agencies as part of a future Draft Plan of Subdivision Application.

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FIGURE 1: SITE OVERVIEW

2559688 Ontario Inc. Kanata North Development (936 March Road)

Removal of Dead Ash Trees - Southern Hedgerow

- Approximate Property Boundary

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

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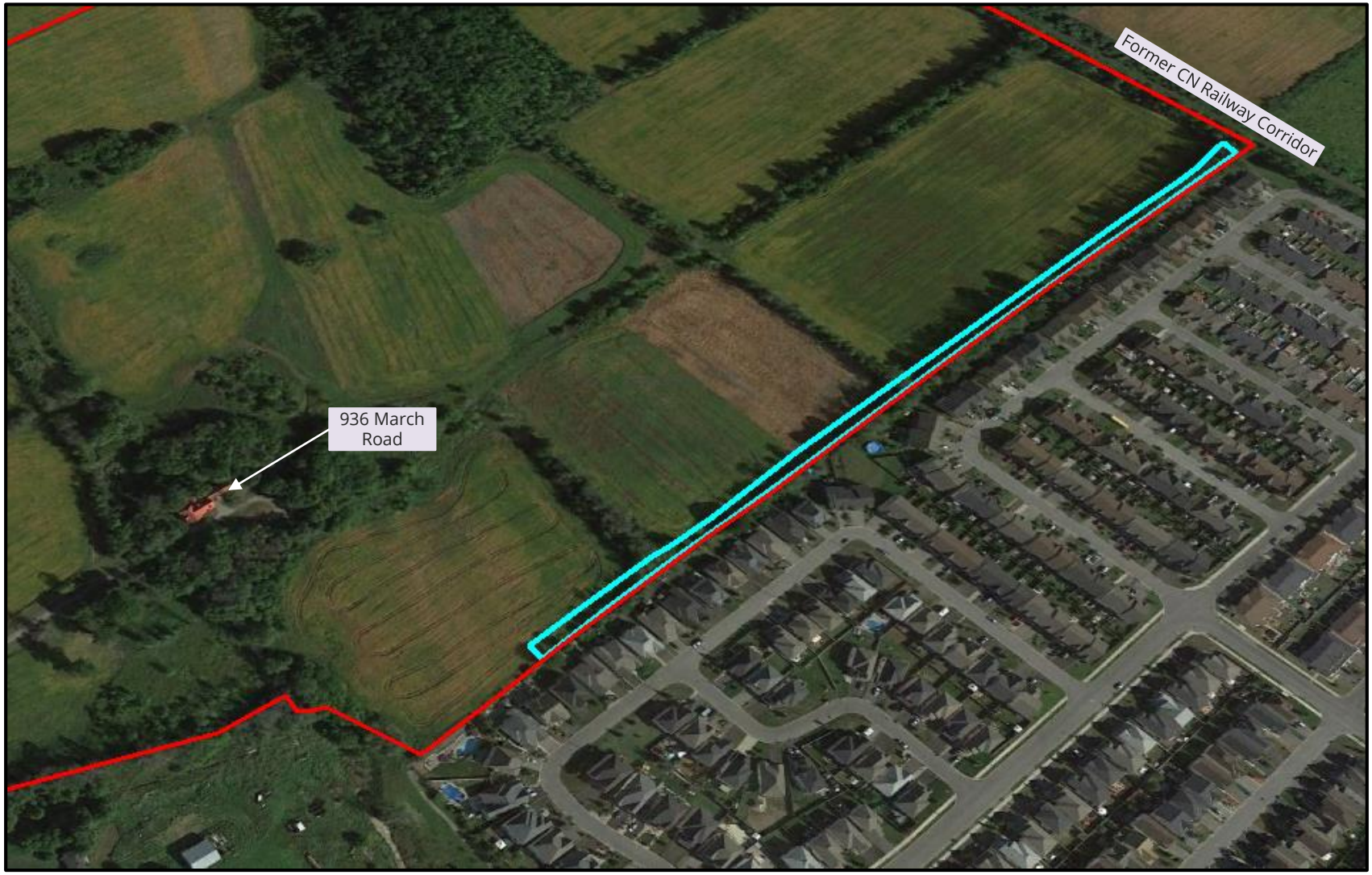
June 2018

FIGURE 2: TREE CLEARING AREA

2559688 Ontario Inc. Kanata North Development (936 March Road)

Removal of Dead Ash Trees - Southern Hedgerow



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

- Approximate Property Boundary
- Tree Removal Area

2.0 DEAD ASH TREES

At the time of writing (June 2018), MES was undertaking fieldwork at the 936 March Road property, in order to complete the Combined EIS and TCR for the proposed subdivision development. Site visits were completed to inventory trees on May 8th and May 29th, 2018. During the May 8th Site visit, trees that are present along the southern property line were inventoried. This included trees within a Deciduous Hedgerow, which will be referred to in the forthcoming Combined EIS and TCR as Vegetation Feature H and Feature J. The Deciduous Hedgerow runs continuously along the southern property line between the 936 March Road parcel and the adjacent residential subdivision (located to the south). The majority of trees within the Deciduous Hedgerow are found growing at the property line between the 936 March Road parcel and the adjacent residential homes. The Deciduous Hedgerow ends at the Former CN Railway Corridor.

During the initial assessment of Feature H and Feature J, it was noted that approximately 80% of stems growing along the southern property line consist of White/Green Ash (*Fraxinus americana/pennsylvanica*). The average size of White/Green Ash trees was measured as 28 cm diameter at breast height (dbh), varying between approximately 19 cm and 37 cm dbh. During surveys of the trees in May 2018, it was noted that the White/Green Ash showed signs of severe stress, due to the effects of the invasive Emerald Ash Borer. This included significant loss of bark, defoliation, Emerald Ash Borer entry holes, and dead wood. The vast majority of White/Green Ash stems were observed to either be dead or significantly declining, due to the Emerald Ash Borer. Ultimately, it is unlikely that any of the mature White/Green Ash found within the Deciduous Hedgerow can be salvaged.

A windstorm in early May resulted in several of the dead ash stems falling over. We understand that this has caused concern among property owners living in the residential subdivision located south of 936 March Road. At the current time, many of the White/Green Ash trees found within Feature H and Feature J (the Southern Hedgerow) may be unstable.

Photograph 1: Looking south at the Deciduous Hedgerow (Feature H) (May 8th, 2018).

Photograph 2: Looking south at the Deciduous Hedgerow (Feature J) (May 8th, 2018).

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Photograph 3: Looking south at the Deciduous Hedgerow. The bare trees are dead White/Green Ash. Many trees with leaves are also White/Green Ash, many of which are significantly declining but not yet dead. Note the fallen trees in the foreground (May 29th, 2018).

Photograph 4: Looking south at the Deciduous Hedgerow. The bare trees are dead White/Green Ash. Note the fallen trees in the foreground (May 29th, 2018).

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3.0 RECOMMENDATIONS

Upon review of the dead and declining White/Green Ash growing within Feature H and Feature J (the Southern Hedgerow), it is recommended that all White/Green Ash trees be removed. In addition to removing dead trees, White/Green Ash trees that are not fully dead but which are visibly declining and/or infested with Emerald Ash Borer should also be removed at the current time, as these trees are likely to die in the near future. Once infested with Emerald Ash Borer, White/Green Ash trees are not capable of recovering and will inevitably die. Given the widespread extent of the Emerald Ash Borer infestation and existing damage at the Site, there is little benefit in retaining any living White/Green Ash. Dead White/Green Ash Trees provide very little natural heritage function, and therefore the trees should not require further assessment and should not be retained.

Reasonable efforts should be undertaken when removing the White/Green Ash trees to direct felled trees to the north (e.g. into the agricultural fields), in order to avoid impacting the adjacent residential properties located to the south. During removal of White/Green Ash along the property line, mitigation measures are required to protect living trees growing beyond the property line within the adjacent residential properties. Reasonable efforts should be made to protect trees on adjacent lands by implementing the following tree preservation mitigation measures:

- A surveyor should mark the property line prior to tree removal, in order to ensure that trees are not removed from the adjacent residential properties;
- Mark trees to be removed 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 tree; and
- Ensure that exhaust fumes from all equipment are directed away from any tree canopy.

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4.0 CLOSURE

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.

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