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Combined Environmental Impact Statement & Tree Conservation Report
Valecraft Kanata North Development
(1020 & 1070 March Road)

April 2019
Prepared for Valecraft Homes Ltd.

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LIST OF FIGURES

EXECUTIVE SUMMARY

McKinley Environmental Solutions (MES) was retained by Valecraft Homes Ltd. to prepare a Combined Environmental Impact Statement (EIS) and Tree Conservation Report (TCR) to support the development of the Northeast Quadrant of the Kanata North Urban Expansion Area (KNUEA), which includes the property at 1020 and 1070 March Road, Ottawa, Ontario (the Site). The Site is part of the approved 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.

The Site is located along the east side of March Road, with the KNUEA Southeast Quadrant located directly to the south, and the KNUEA Northwest 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 rural estate subdivision is located north of the Site. March Valley Road is located to the east, beyond which is a federally owned property managed by the Department of Defense. A Former CN Railway Corridor runs in an approximately north-south direction through the Site. The Former CN Railway Corridor represents the urban boundary of the City of Ottawa. The portions of the Site that are west of the Former CN Railway Corridor are within the urban area of the City of Ottawa, whereas the portions of the Site that are east of the Former CN Railway Corridor are within the rural area.

The Site is approximately 47.8 ha in size. The majority of the Site consists of agricultural lands that are actively cultivated. This includes Cultivated Fields that were planted with soybeans and berries in the summer of 2018, as well as recently Fallow Agricultural Fields that are regenerating with both graminoid and forb dominated meadows. A small apple orchard and lawn are also present adjacent to the recently demolished farmhouse. Treed habitats within the Site include several Deciduous, Mixed, and Coniferous Hedgerows, two (2) small tree stands, Woodlot S-20 and surrounding areas of recent growth, and Woodlot S-23 and surrounding areas of recent growth.

The North Tributary (Tributary #2) of Shirley's Brook currently flows within the roadside ditch of March Road adjacent to the western Site boundary. At the southwest corner of the Site, the North Tributary turns east and flows along the southern Site boundary. Approximately 180 m east of March Road, the Northern Field Drainage Channel merges with the North Tributary, beyond which the North Tributary turns south and flows into the Southeast Quadrant of the KNUEA. The Northern Field Drainage Channel is not considered a significant ecological feature. Several Ephemeral Farm Drainage Channels are present in the eastern part of the Site. These are also not considered significant ecological features. As such, the KNUEA Community Design Plan (CDP) and Environmental Management Plan

(EMP) did not identify the North Field Drainage Channel and the Ephemeral Farm Drainage Channels for retention.

The CDP and the associated 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. Within the Site, this corridor was identified to retain the North Tributary (Tributary #2) in the southwest corner of the Site. Block 311 has been designated in order to accommodate the minimum 40 m wide corridor surrounding the North Tributary. The KNUEA EMP also identifies that during development of the Site, the portion of the North Tributary which flows within the roadside ditch of March Road is to be realigned approximately 20 m east of March Road. The realignment of the North Tributary is anticipated to result in an improvement in the quality of aquatic and riparian habitat for Blanding's Turtles, amphibians, fish, and other wildlife. During the realignment process, habitat restoration and enhancement works will be undertaken.

The Site will be developed to accommodate approximately 297 single detached houses and approximately 315 townhomes. Blocks 324 and 327 are identified for Commercial/Mixed Use, and Block 322 is identified as Medium Density. Block 310 is an institutional block for a future school. The Site development will include construction of Street #1, which will connect the development to March Road. Block 306 will remain undeveloped at the end of Street #1 in order to accommodate a potential future road connection. Block 312 will accommodate a 6 m wide recreational pathway, which is required by the CDP along the edge of the minimum 40 m wide North Tributary watercourse corridor. The pathway is shown along the eastern and northern side of the minimum 40 m wide North Tributary watercourse corridor. Blocks 303, 304, 305, 326 and 329 provide pathway connections. Block 309 includes an approximately 1.71 ha municipal park. A new Stormwater Management (SWM) pond will be constructed east of the Former CN Railway Corridor. 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. The limits of the retained area of Woodlot S-23 will depend on the final detailed design of the SWM Pond. It is anticipated that the core of Woodlot S-23 will ultimately be retained. The EMP specifies that the proposed inlet channels to the new SWM pond will be built outside the limits of Woodlot S-23. The Site 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.

In addition to the retention of a portion of Woodlot S-23, the KNUEA EMP also identified that a stand of mature White Cedar Trees should be retained within the development area (Novatech 2016a; 2016b). The Park Block (Block 309) will preserve the stand of White Cedar Trees, which includes a portion of the Fresh-Moist White Cedar Coniferous Forest (Vegetation Feature O). The Site is anticipated to be developed in multiple phases over several years. However, it is anticipated that the

Site will be cleared during the initial phase of development, as servicing and grading requirements are not anticipated to allow for phased tree removal.

Several Species at Risk (SAR) and their habitats have been documented within the Site. This includes documented occurrences of Butternut Trees (endangered) and the habitat of Blanding's Turtle (threatened) within the Site. As described below, this report was prepared with updated field surveying results from the late summer and autumn of 2018. In order to address the potential presence of additional SAR, updated targeted surveying is planned in the spring and summer of 2019. This will included updated breeding bird surveys, Eastern Whip Poor Will call surveys, amphibian call surveys, and a Headwaters Drainage Assessment of the North Tributary (Tributary #2) and the Northern Field Drainage Channel. The additional surveys will confirm the presence/absence of nesting Eastern Meadowlark (threatened), Bobolink (threatened), Barn Swallow (threatened), and Eastern Whip Poor Will (threatened), as well as additional species. The 2019 survey results will be provided to the City through a follow-up addendum to this Combined EIS and TCR.

Due to the presence of Butternut Trees and Blanding's Turtle habitat, an Overall Benefit Permit under Clause 17(2)(C) of the Ontario Endangered Species Act is anticipated to be required to support the development. Requirements for additional SAR, if any, will be determined based on the 2019 survey results.

Pending that the regulatory, mitigation, and avoidance measures outlined in this report are implemented appropriately, the development of the Northeast 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, 4.2.3 and 4.4.2. 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 EIS and TCR was undertaken following the City of Ottawa's Environmental Impact Statement Guidelines. Following the City guidelines, the Environmental Impact Statement (EIS) includes the following:

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

This Combined EIS and TCR was prepared with guidance from the *Natural Heritage Reference Manual* (OMNRF 2010). The major objective of this Combined EIS and TCR is to demonstrate that the proposed project will not negatively affect the significant features and functions of the Site, and that impacts will be minimized through mitigation measures.

1.3 Site Overview and Background (TCR)

The Site 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 Northeast Quadrant of the KNUEA includes the parcels at 1020 March Road and 1070 March Road (Ottawa, Ontario), which are proposed to be developed by Valecraft Homes (the Site) (Figure 1).

The Site is located along the east side of March Road, with the KNUEA Southeast Quadrant located directly to the south, and the KNUEA Northwest 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 rural estate subdivision is located north of the Site. March Valley Road is located to the east, beyond which is a federally owned property managed by the Department of Defense. A Former CN Railway Corridor runs in an approximately north-south direction through the Site. The Former CN Railway Corridor represents the urban boundary of the City of Ottawa. The portions of the Site that are west of the Former CN Railway Corridor are within the urban area of the City of Ottawa, whereas the portions of the Site that are east of the Former CN Railway Corridor are within the rural area.

The Site is approximately 47.8 ha in size. The majority of the Site consists of agricultural lands that are actively cultivated. This includes Cultivated Fields that were planted with soybeans and berries in the summer of 2018, as well as recently Fallow Agricultural Fields that are regenerating with both graminoid and forb dominated meadows. A small apple orchard and lawn are also present adjacent to the recently demolished farmhouse. Treed habitats within the Site include several Deciduous, Mixed, and Coniferous Hedgerows, two (2) small tree stands, Woodlot S-20 and surrounding areas of recent growth, and Woodlot S-23 and surrounding areas of recent growth.

The North Tributary (Tributary #2) of Shirley's Brook currently flows within the roadside ditch of March Road adjacent to the western Site boundary. At the southwest corner of the Site, the North Tributary turns east and flows along the southern Site boundary. Approximately 180 m east of March Road, the Northern Field Drainage Channel merges with the North Tributary, beyond which the North Tributary turns south and flows into the Southeast Quadrant of the KNUEA. The Northern Field Drainage Channel is not considered a significant ecological feature (discussed in greater detail in Section 3.4). Several Ephemeral Farm Drainage Channels are present in the eastern part of the Site. These are also not considered significant ecological features (Refer to Section 3.4) (MEP 2015).

Lastly, several Species at Risk (SAR) and their habitats were documented within the Site as part of the Existing Conditions Natural Environment Features Report (MEP 2016), which was completed to support the KNUEA Environmental Management Plan (EMP) (Novatech 2016b). This included documented occurrences of Butternut Trees (endangered) and the habitat of Blanding's Turtle (threatened) within the Site. The potential for Bobolink (threatened) and Barn Swallow (threatened) to occur within the Site has been noted previously, however, active nesting by Bobolink and Barn Swallow within the Site has not been confirmed. As described below in Section 2.0.2, follow-up breeding bird surveys are scheduled in the spring and summer of 2019, in order to verify the presence/absence of nesting Bobolink and Barn Swallow (as well as other SAR). 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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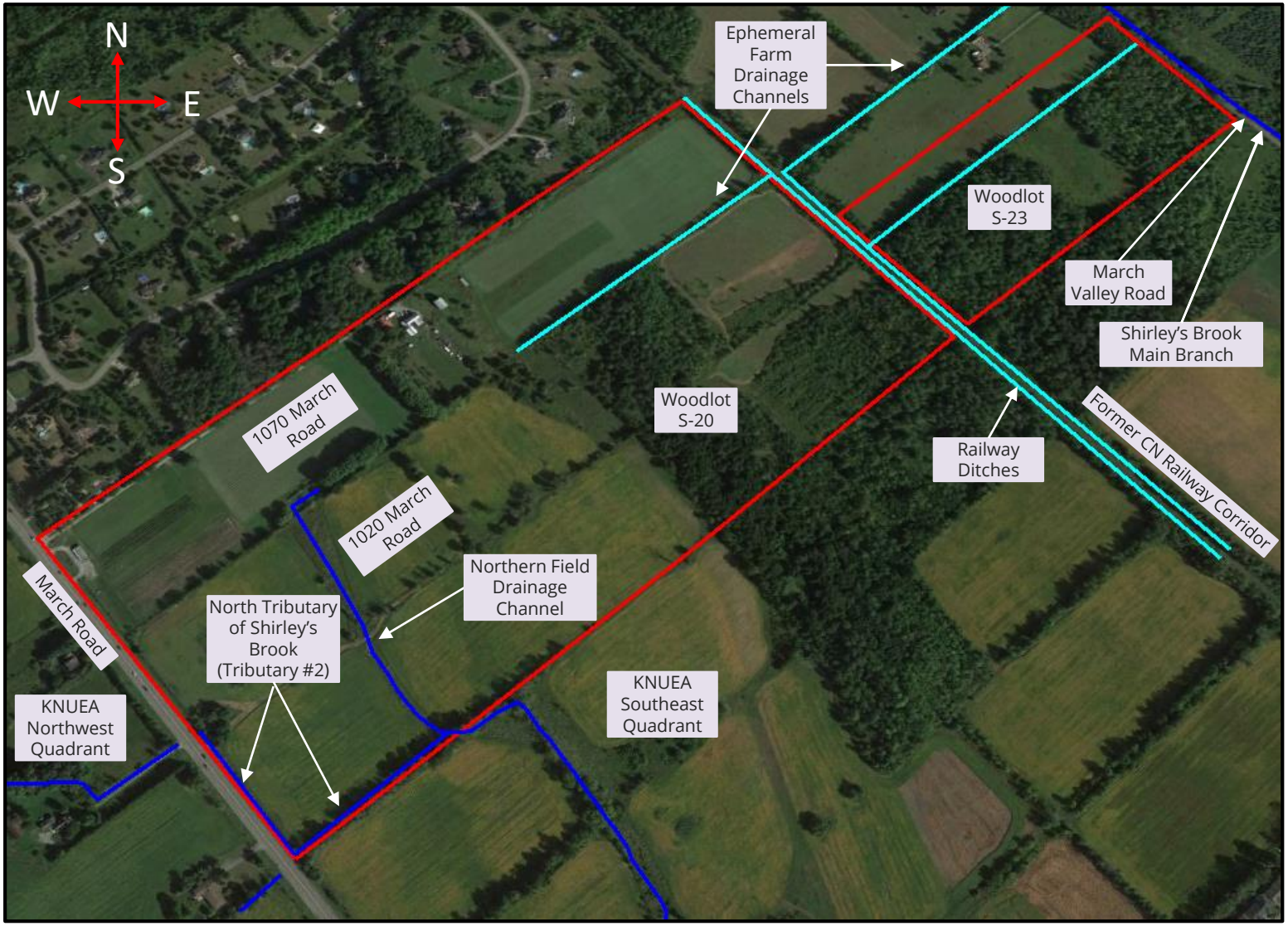
April 2019

FIGURE 1: SITE OVERVIEW

Valecraft Kanata North Development (1020 & 1070 March Road)
Combined Environmental Impact Statement and Tree Conservation Report



- Site Boundary

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

1.4 Description of Undertaking (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). Within the Site, this corridor was identified to retain the North Tributary (Tributary #2) in the southwest corner of the Site. Block 311 has been designated in order to accommodate the minimum 40 m wide corridor surrounding the North Tributary. The KNUEA EMP also identifies that during development of the Site, the portion of the North Tributary which flows within the roadside ditch of March Road is to be realigned approximately 20 m east of March Road. As discussed below in Section 4.2.2, the realignment of the North Tributary is anticipated to result in an improvement in the quality of aquatic and riparian habitat for Blanding's Turtles (as well as other wildlife). During the realignment process, habitat restoration and enhancement works will be undertaken. Habitat improvements are anticipated to be required to meet the requirements of a future Overall Benefit Permit for Blanding's Turtle under the Ontario Endangered Species Act. Due to the presence of Butternut Trees and Blanding's Turtle habitat, an Overall Benefit Permit under Clause 17(2)(C) of the Ontario Endangered Species Act is anticipated to be required (refer to Section 1.6 for additional detail). As discussed below in Section 4.4.4, the minimum 40 m wide corridor surrounding the North Tributary will include fencing that will be designed to prevent Blanding's Turtle and other wildlife from leaving the minimum 40 m wide watercourse corridor to enter the subdivision/roads.

The Northern Field Drainage Channel is not considered a significant ecological feature. The Ephemeral Farm Drainage Channels are also not considered significant ecological features (discussed in greater detail in Section 3.4) (MEP 2015). As such, the KNUEA EMP did not identify the North Field Drainage Channel and the Ephemeral Farm Drainage Channels for retention (Novatech 2016b).

The Draft Plan of Subdivision is included below. The Site will be developed to accommodate approximately 297 single detached houses and approximately 315 townhomes. Blocks 324 and 327 are identified for Commercial/Mixed Use, and Block 322 is identified as Medium Density. Block 310 is an institutional block for a future school. The Site development will include construction of Street #1, which will connect the development to March Road. Block 306 will remain undeveloped at the end of Street #1 in order to accommodate a potential future road connection. Block 312 will accommodate a 6 m wide recreational pathway, which is required by the CDP along the edge of the minimum 40 m wide North Tributary watercourse corridor. The pathway is shown along the eastern and northern side of the minimum 40 m wide North Tributary watercourse corridor. Blocks 303, 304, 305, 326 and 329 provide pathway connections. Block 309 includes an approximately 1.71 ha municipal park. A new Stormwater Management (SWM) pond will be constructed east of the Former CN Railway Corridor.

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. The limits of the retained area of Woodlot S-23 will depend on the final detailed design of the SWM Pond. It is anticipated that the core of Woodlot S-23 will ultimately be retained. The EMP specifies that the proposed inlet channels to the new SWM pond will be built outside the limits of Woodlot S-23. The Site 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.

In addition to the retention of a portion of Woodlot S-23, the KNUEA EMP also identified that a stand of mature White Cedar Trees should be retained within the development area (Novatech 2016a; 2016b). The Park Block (Block 309) will preserve the stand of mature White Cedar Trees, which includes a portion of the Fresh-Moist White Cedar Coniferous Forest (Vegetation Feature O). The Site is anticipated to be developed in multiple phases over several years. However, it is anticipated that the 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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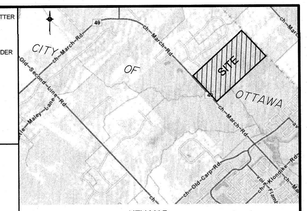
SUBJECT TO THE CONDITIONS, IF ANY, SET FORTH IN OUR LETTER DATED _____

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 MAP
NOT TO SCALE

DRAFT PLAN OF SUBDIVISION OF

PART OF LOT 13
CONCESSION 4
Geographic Township of March
CITY OF OTTAWA

Prepared by Annis , O'Sullivan , Vollebekk Ltd.

Scale 1 : 1000

40 30 20 10 0 20 40 Metres

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

SURVEYOR'S CERTIFICATE

I CERTIFY THAT :
The boundaries of the lands to be subdivided and their relationship to adjoining lands have been accurately and correctly shown.

_____ Date

_____
V. Andrew Shelp
ONTARIO LAND SURVEYOR

OWNER'S CERTIFICATE

This is to certify that we are the owners of the lands to be subdivided and that this plan was prepared in accordance with our instructions.

_____ Date

_____
Danny Page, Manager of Planning
Valecraft Homes Ltd.
I have the authority to bind the corporation.

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51-17 OF THE PLANNING ACT

(a) see plan
(b) see plan
(c) see plan
(d) single, multi-family residential housing, institutional, commercial / mixed use, park and open space
(e) see plan
(f) see plan
(g) see plan
(h) City of Ottawa
(i) see soils report
(j) see plan
(k) sanitary, storm sewers, municipal water, bell, hydro, cable and gas to be available
(l) see plan

REVISION SCHEDULE			
NO.	REVISION	DATE	BY
5	REMOVED ST. IS WITH LOT/BLK REVISION	APR 11, 2019	N
4	NEW STREET IS WITH LOT/BLK REVISION	MAR. 19, 2019	DG
3	REVISIONS PER ENVIRO / ENG REVIEW	MAR. 15, 2019	N
2	REVISIONS	MAR. 5, 2019	N
1	PLAN PREPARED	2019	N

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Ontario Land Surveyors

Job No. 18096-III Valecraft Pt Lt 13 C4 MA DPS.DS 00

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 will be 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 under Clause 17(2)(C) of the Ontario Endangered Species Act (ESA) will be required to support the undertaking. Extensive consultation and review will be undertaken with the Ministry of Environment, Climate Change, and Parks (MECP) as part of the ESA permitting process.

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1.6 Regulatory Requirements (TCR)

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

- **Ontario Endangered Species Act (ESA):** Habitat for Blanding's Turtle (threatened), habitat for Butternut Trees (endangered), and individual Butternut Trees are known to occur within the Site. As such, an Overall Benefit Permit 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 Site, it is anticipated that both species will be addressed through a combined permit application. The mitigation and habitat compensation requirements for Butternut Trees and Blanding's Turtle are discussed below in Section 4.4. The potential for Bobolink (threatened) and Barn Swallow (threatened) to occur within the Site has previously been noted (MEP 2016). However, active nesting by Bobolink and Barn Swallows within the Site has not been confirmed. As described below in Section 2.0.2, follow-up breeding bird surveys are scheduled in the spring and summer of 2019, in order to verify the presence/absence of nesting Bobolink and Barn Swallows (as well as other Species at Risk). Endangered Species Act requirements for Bobolink and Barn Swallows, if any, will be determined based on the 2019 survey results.
- **Ontario Regulation 153/06:** Ontario Regulation 153/06 regulates activities that would alter shorelines, watercourses, and wetlands. The planned realignment of the North Tributary of Shirley's Brook (referred to as Tributary #2 in the EMP) will require obtainment of a permit from the Mississippi Valley Conservation Authority (MVCA) under O.Reg 153/06. A Headwaters Drainage Assessment (HDA) (TRCA 2014) is scheduled to be completed between April and July 2019 in order to support the design and review process for the planned realignment of the North Tributary. Following completion and approval of the HDA, a detailed design for the North Tributary realignment will be developed and submitted to the MVCA for approval.
- **Fisheries Act:** The realignment of the North Tributary will require alteration to fish habitat. As described below in Section 3.4.3, the North Tributary does not appear to provide significant habitat for recreational or commercial fisheries. As discussed in Section 4.2.2, the realignment process is anticipated to result in a net improvement in the quality of fish habitat. Therefore, it is anticipated that an authorization under the Fisheries Act is unlikely to be required. However, Department of Fisheries and Oceans (DFO) guidelines are such that the realignment of the North Tributary will require submission of a review request to DFO. The DFO review request will be submitted following completion of the HDA.
- **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 September 4th, 2018 and September 14th, 2018. Conditions during the site visits included temperatures of 27 ºC with sunny skies and temperatures of 20 ºC with sunny skies (on September 4th and September 14th, respectively). Vegetation communities were also previously surveyed and classified by Muncaster Environmental Planning (MEP) as part of the Existing Conditions Natural Environment Features 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. Lastly, a detailed Butternut Health Assessment (BHA) was completed to inventory Butternut Trees and provide an assessment of their health status. The BHA methodology is discussed in the following section.

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.

Plant communities within the Site were classified according to the vegetation communities described in the Ecological Land Classification (ELC) manual (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 by MES in areas of continuous forest cover by undertaking TCR sampling plots. Plots were measured 5 m by 10 m to give a total survey area of 50 m^2 (for each plot). Plots were distributed evenly within the forested portions of the Site to achieve the desired density of 1 plot per hectare. 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 C (Section 3.3). Trees within each plot/transect that were 10 cm dbh or greater were measured with the use of a D-tape, which is a calibrated dbh tape.

As described below, additional updated field surveys are planned in the spring and summer of 2019. During the Draft Plan of Subdivision application review process for the KNUEA Southeast Quadrant (936 March Road), 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 inventory applies to both the 936 March Road and the 1020/1070 March Road properties. The large tree inventory will be undertaken in the summer of 2019, and will identify the location, condition, and species of trees ≥50 cm dbh within Woodlot S-23. The results of the large tree inventory will help guide the detailed design process for the SWM pond. The large tree inventory results will be provided to the City through a follow-up addendum to this Combined EIS and TCR. Any additional plant species observed during the spring and summer 2019 surveying will be noted in the addendum.

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2.0.2 EIS Methodology and Species at Risk Surveys

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 Natural Environment Features 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;
- Obtainment of an Information and Records Request Response from the Ontario Ministry of Natural Resources and Forestry (OMNRF) (Appendix D);
- Review of Official Plan designations; and
- Review of the background geotechnical report (Paterson 2013).

Detailed assessments of natural heritage features were completed as follows:

- **Plant Inventory and ELC Classification:** See description above.
- **Butternut Trees:** Butternut Trees were documented in several locations throughout the Site 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 Site in 2018. The BHA is included in Appendix C. Refer to Appendix C 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 EIS and 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, Eastern Small Footed Myotis, Tricolored Bat, Northern Long Eared Bat):** No caves, bedrock fissures, mining shafts, abandoned buildings, or other features which may function as bat hibernacula habitat were noted within the Site. The OMNRF (2011b) guidelines for bat surveying are outlined in the *Bats and Bat Habitats: Guidelines for Wind Power Projects*. These guidelines state that deciduous and mixed forest habitats have the potential to provide maternity roosting sites. 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. As described in greater detail in Section 3.7.5, none of the forest communities within the Site qualify as potential maternity roosting sites, due to either their composition (e.g. coniferous forest) or their age (e.g. average tree size <25 cm dbh). As such, a snag/cavity tree count was not required.

Additional surveying will be undertaken in the spring and summer of 2019 to provide updated survey results for several Species at Risk (SAR). Spring and summer SAR survey results and the results of the large tree inventory (described above in Section 2.0.1), will be provided to the City through an addendum to this Combined EIS and TCR. The addendum will discuss the survey methods, findings, and any additional potential impacts, mitigation requirements, and/or regulatory requirements.

Additional SAR surveys will include the following:

- **Breeding Bird Survey (Eastern Meadowlark, Bobolink, Barn Swallow):** In order to assess the potential presence of breeding migratory birds and the extent of their habitat within the Site, a breeding bird survey will be undertaken following the OMNRF *Wildlife Monitoring Programs and Inventory Techniques - Technical Manual* (Konze & McLaren 1998) Breeding Bird Survey (BBS) method. This includes completion of three (3) site surveys in May and June. The timing and methodology of the surveys will follow the requirements outlined in the OMNRF *Survey Methodology under the Endangered Species Act: Dolichonyx oryzivorus (Bobolink)* (OMNRF 2011a). The bird surveys will address the potential presence of Bobolink, Eastern Meadowlark, Barn Swallow and other breeding bird species. The breeding bird survey will be completed in the spring and summer of 2019. The planned bird survey points are shown in Figure 5 (below). During the survey, all interior and exterior surfaces of buildings within the Site will be searched to confirm the presence/absence of Barn Swallow nests.
- **Eastern Whip Poor Will Call Surveys:** The Kanata North Existing Conditions Natural Environment Features Report (MEP 2016) included surveying for Eastern Whip Poor Will, and none were found in the area. However, surveying was completed in 2014, and the OMNRF has since identified Eastern Whip Poor Will as a potential concern. Eastern Whip Poor Will surveys will be undertaken following the OMNRF *Draft Survey Protocol for Eastern Whip Poor Will* (OMNRF 2014d). This protocol necessitates that three (3) Eastern 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. The Eastern Whip Poor Will call surveys will be completed in the spring and summer of 2019. The planned Eastern Whip Poor Will survey points are shown in Figure 8 (below).

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2.0.3 Headwaters Drainage Assessment Methodology

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 Shirley's Brook within the Site were also completed by MES in September 2018. This information was utilized to assess the aquatic habitat features for the purposes of this Combined EIS and TCR. However, a more detailed Headwaters Drainage Assessment (HDA) is anticipated to be required in order to support the MVCA's review of the project and permitting under O.Reg. 153/06, as well as the Department of Fisheries and Ocean's (DFO) review under the Fisheries Act. To support these requirements, a detailed HDA is scheduled to be completed from April to July 2019. The updated HDA will be undertaken following the *Evaluation, Classification and Management of Headwater Drainage Features Guideline* (TRCA 2014) and will include the application of *OSAP Module S4.M10 – Assessing Headwater Drainage Features* (Stanfield et al. 2013), updated electrofishing surveys, and amphibian surveying following the *Marsh Monitoring Program – Amphibian Call Counts Method* (Konze and McLaren 1998). This method includes three (3) night time surveys in April, May, and June to survey for amphibian breeding activity by listening for frog calls. The HDA will be presented as a separate report under separate cover.

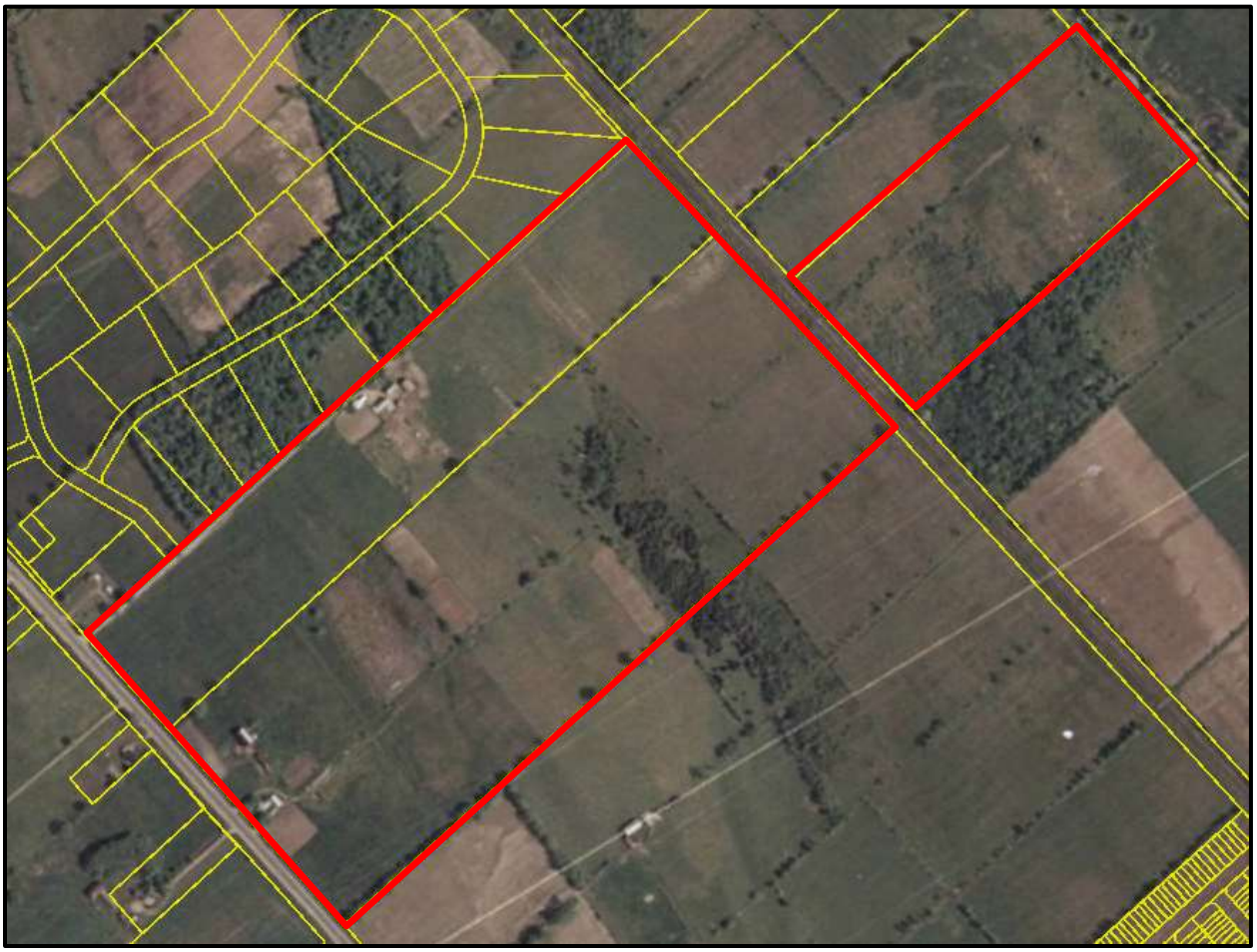
3.0 EXISTING CONDITIONS

3.1 Geological Conditions

The western part of the Site has a gradual slope from approximately 80 m ASL at March Road to approximately 78 m ASL in the vicinity of the former farmhouse (which was recently demolished). East of the former farmhouse, the Site slopes downwards to approximately 72 m ASL at the Former CN Railway Corridor. East of the railway corridor, the Site continues to slope downwards to approximately 66 m ASL at March Valley Road. Surface drainage within the Site is hence primarily west to east, although the North Tributary flows from north to south along the southwestern property boundary, before turning east and flowing west-east along the southern property boundary. Paterson Group (2013) note that within the 1020 March Road parcel, subsoil conditions consist of topsoil, compact silty sand, stiff silty clay, and/or glacial till. Within the 1070 March Road parcel, subsoil conditions consist of topsoil and compact silty sand and stiff silty clay. A glacial till layer was also noted at all test pit locations. Paterson Group (2013) note that based on available geological mapping, the bedrock conditions below the majority of the Site consists of interbedded sandstone and dolomite of the March formation. The overburden thickness varies from approximately 0.2 m to 4.6 m depth throughout the majority of the Site.

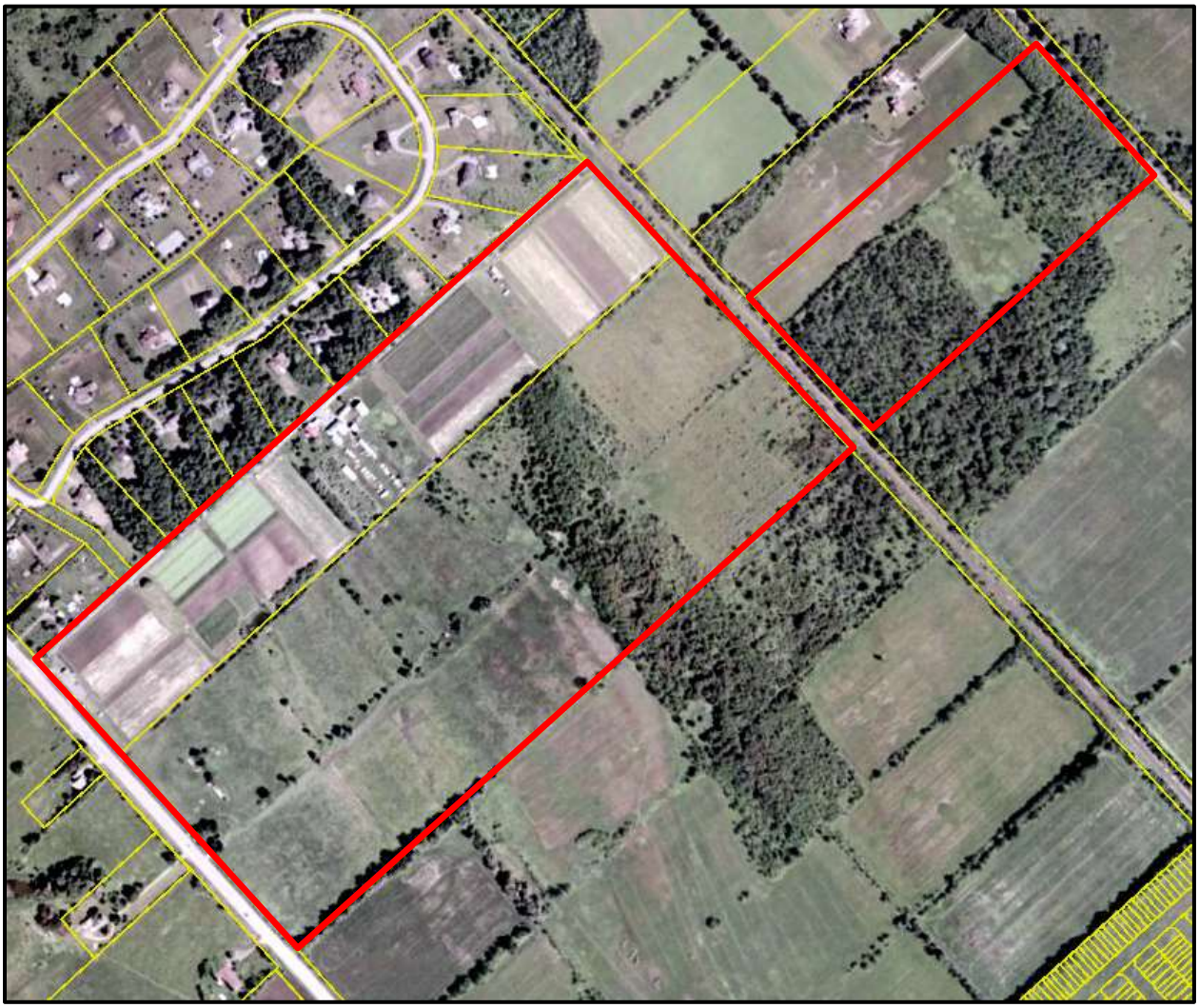
3.2 Site History (TCR)

Air photos from 1976, 1991 and 2005 are included below (Photos from City of Ottawa 2019). Recent air photos are included in the report figures. The oldest available air photo (from 1976) shows that the overall composition of the Site was similar in 1976, with most of the Site intensively farmed. The western portion of Woodlot S-20 is present in 1976, with mature tree cover evident. Within the portions of Woodlot S-23 that overlap the Site, very limited recent regrowth is visible in 1976. The eastern portion of Woodlot S-20, most of the Coniferous, Mixed, and Deciduous Hedgerows, and the portions of Woodlot S-23 that occur within the Site are all largely devoid of mature tree cover in 1976. The western portion of Woodlot S-20, and both the western and eastern portions of Woodlot S-23 that occur within the Site appear to include mature tree cover in 1991. Deciduous Hedgerow B is also visible in 1991 (present along the southern Site boundary). Most of the Coniferous, Mixed, and Deciduous Hedgerows are first visible in 2005. The Willow Shrub Thicket (Feature Q) does not appear to include mature tree or shrub cover in 2005. The historic air photos indicate that at the current time, trees within the western portion of Woodlot S-20 are greater than approximately 40 years of age, trees within Deciduous Hedgerow B and both the western and eastern portions of Woodlot S-23 that occur within the Site are approximately 20 to 30 years of age, and the northern/eastern portion of Woodlot S-20, the majority of the Coniferous, Mixed and Deciduous Hedgerows, and the Willow Shrub Thicket (Feature Q) are all likely to be less than approximately 20 years of age.



Historic Air Photograph 1: Historic Air Photo from 1976 (Site limits shown in red). Note that the overall composition of the Site was similar in 1976, with most of the Site intensively farmed. The western portion of Woodlot S-20 is present in 1976, with mature tree cover evident. Within the portions of Woodlot S-23 that overlap the Site, very limited recent regrowth is visible in 1976. The eastern portion of Woodlot S-20, most of the Coniferous, Mixed, and Deciduous Hedgerows that are currently found within the Site, and the portions of Woodlot S-23 that occur within the Site are all largely devoid of mature tree cover in 1976. This suggests that while some tree cover in the western portion of Woodlot S-20 is likely older than approximately 40 years of age, the majority of the trees that are currently found throughout the remainder of the Site are likely less than approximately 40 years of age. The portion of Woodlot S-23 that occurs within the adjacent property (the Southeast Quadrant of the KNUEA), includes mature tree cover in 1976 (Photos from City of Ottawa 2019).

Historic Air Photograph 2: Historic Air Photo from 1991 (Site limits shown in red). Note that the overall composition of the Site was similar in 1991, with most of the Site intensively farmed. The western portion of Woodlot S-20, and both the western and eastern portions of Woodlot S-23 that occur within the Site appear to include mature tree cover in 1991. Deciduous Hedgerow B is also visible in 1991 (present along the southern Site boundary). The majority of the remaining Coniferous, Mixed, and Deciduous Hedgerows, and the eastern and northern portions of Woodlot S-20 do not appear to include significant mature tree cover in 1991 (Photos from City of Ottawa 2019).



Historic Air Photograph 3: Historic Air Photo from 2005 (Site limits shown in red). Note that the overall composition of the Site was similar in 2005, with most of the Site intensively farmed. The western portion of Woodlot S-20, and both the western and eastern portions of Woodlot S-23 that occur within the Site appear to include mature tree cover in 2005. Most of the Coniferous, Mixed, and Deciduous Hedgerows are also visible in 2005. The Willow Shrub Thicket (Feature Q) does not appear to include mature tree or shrub cover in 2005 (Photos from City of Ottawa 2019).

3.3 Vegetation Communities (TCR)

The majority of the Site consists of agricultural lands that are actively cultivated. This includes Cultivated Fields that were planted with soybeans and berries in the summer of 2018, as well as recently Fallow Agricultural Fields that are regenerating with both graminoid and forb dominated meadows. A small apple orchard and lawn are also present adjacent to the recently demolished farmhouse. Vegetation communities found within the Site include the following:

- Previously Developed Areas;
- Deciduous Hedgerows (Features A to H);
- Mixed Hedgerow (Feature I);
- Coniferous Hedgerows (Features J to L);
- Tree Stands (Features M & N);
- Woodlot S-20 (Features O & P);
    - Fresh-Moist White Cedar Coniferous Forest (Feature O)
    - Fresh-Moist Ash – Elm Deciduous Forest – West (Feature P)
- Willow Shrub Thicket (Feature Q);
- Woodlot S-23 (Features R & S);
    - Fresh-Moist Poplar Deciduous Forest (Feature R)
    - Fresh-Moist Ash – Elm Deciduous Forest – East (Feature S)
- Cultivated Fields;
- Fallow Agricultural Fields (Graminoid Meadow); and
- Fallow Agricultural Fields (Forb Meadow).

The extent of these vegetation communities is shown in Figures 2 & 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.

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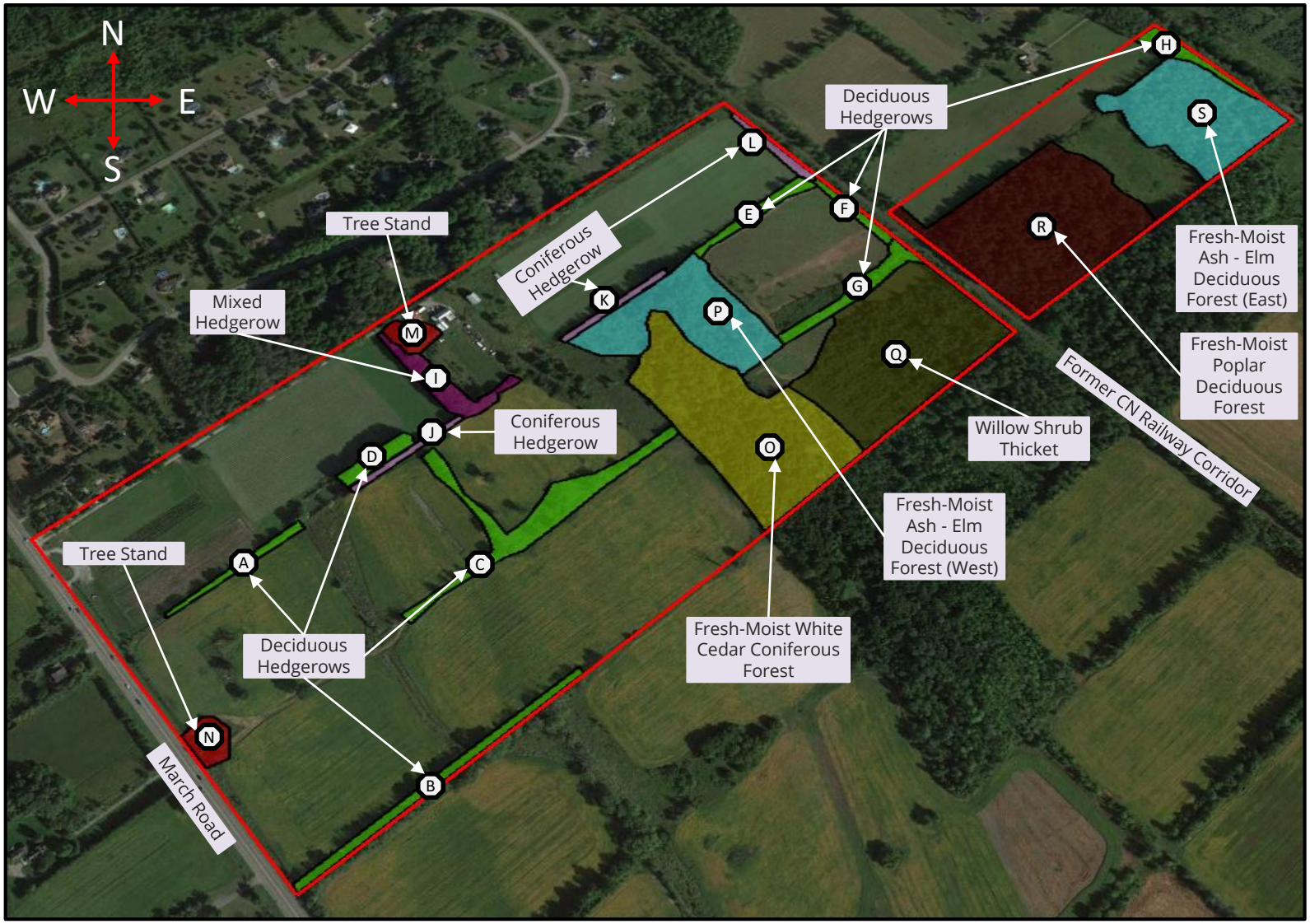
April 2019

FIGURE 2: TREED HABITATS

Valecraft Kanata North Development (1020 & 1070 March Road)
Combined Environmental Impact Statement and Tree Conservation Report



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

3.3.1 Previously Developed Areas

A driveway from March Road provides access to the Site. The farmhouse that was previously present within the Site was recently demolished.

3.3.2 Treed Habitats and Tree Inventory (TCR)

The following is a summary of the treed habitats found within the Site. A tree inventory was completed in all treed areas.

Deciduous Hedgerows (Features A to H)

There are eight (8) Deciduous Hedgerows within the Site. Deciduous Hedgerow locations are shown in Figure 2 and tree sizes for Deciduous Hedgerows B, D and H are shown in Table A. The remaining Deciduous Hedgerows were too sparse to allow transects to be completed, and hence they are not included in Table A. Instead, tree sizes for the remaining Deciduous Hedgerows are described below. As noted below, the species composition of trees within the Deciduous Hedgerows varies throughout the Site. White/Green Ash are dominant in many of the hedgerows. 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. All of the Deciduous Hedgerows have similar shrub and groundcover, with the exception of Deciduous Hedgerow H (described below). For the remaining hedgerows, shrub cover includes 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, 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:

- **Deciduous Hedgerow A:** Deciduous Hedgerow A is a sparse feature which is dominated by dead/dying White/Green Ash between approximately 10 cm and 30 cm dbh in size.
- **Deciduous Hedgerow B:** Deciduous Hedgerow B contains the portion of the North Tributary that flows in a west to east direction along the southern property line. On the north bank of the North Tributary (e.g. within the Site), Deciduous Hedgerow B is dominated by White/Green Ash between approximately 20 cm and 35 cm dbh in size. Most of the White/Green Ash are either dead or dying. Bur Oak, Basswood, and Manitoba Maple are also well represented, with each varying in size between approximately 10 cm and 30 cm dbh.

- **Deciduous Hedgerow C:** Deciduous Hedgerow C is a sparse feature with Manitoba Maple, White Cedar, American Elm, and isolated dead/dying White/Green Ash between approximately 20 cm and 60 cm dbh in size. An 84 cm dbh American Elm is also present.
- **Deciduous Hedgerow D:** Deciduous Hedgerow D is a planted stand of Crack Willow between approximately 10 cm and 40 cm dbh in size.
- **Deciduous Hedgerows E to G:** Deciduous Hedgerows E, F and G are all sparse features with Trembling Aspen, Manitoba Maple, American Elm, and dead/dying White/Green Ash between approximately 10 cm and 25 cm dbh in size. Staghorn Sumac and Slender Willow shrubs are also present.
- **Deciduous Hedgerow H:** Deciduous Hedgerow H occurs along the west side of March Valley Road. The feature is dominated by Crack Willow that are between approximately 20 cm and 35 cm dbh in size. White/Green Ash, Sugar Maple, and Manitoba Maple between approximately 10 cm and 25 cm dbh in size are well represented. Shrub and groundcover differ from Deciduous Hedgerows A to G, likely due to moister soil conditions. Shrub cover is sparse and ground cover includes False Solomon's Seal, Poison Ivy, Sensitive Fern, Lady Fern, Spinulose Wood Fern, White Snakeroot, Common Blue Violet, Canada Anemone, Spotted Touch Me Not, Clearweed, and Common Nettle.

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Table A: Deciduous Hedgerows					
Common Name	**Scientific Name**	**Average DBH**	**DBH Standard Deviation**	**% Occupancy**	**Estimated Stems Per Hectare***
Deciduous Hedgerow - Feature B (1 Transect)					
White/Green Ash	*Fraxinus americana/pennsylvanica*	27	7	50%	1200
Bur Oak	*Quercus macrocarpa*	17	12	25%	600
Basswood	*Tilia americana*	19	5	17%	400
Manitoba Maple	*Acer negundo*	13	N/A	8%	200
Deciduous Hedgerow - Feature D (1 Transect)					
Crack Willow	*Salix fragilis*	24	13	100%	2400
Deciduous Hedgerow - Feature H (1 Transect)					
Crack Willow	*Salix fragilis*	29	7	36%	1600
White/Green Ash	*Fraxinus americana/pennsylvanica*	12	3	27%	1200
Sugar Maple	*Acer saccharum*	17	8	18%	800
Manitoba Maple	*Acer negundo*	9	4	18%	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 1: Looking south at the Deciduous Hedgerow (Feature A) (September 4th, 2018).

Photograph 2: Looking east at the Deciduous Hedgerow (Feature B) (September 4th, 2018).

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Photograph 3: Looking north at the Deciduous Hedgerow (Feature C) (September 4th, 2018).

Photograph 4: Looking east at the Deciduous Hedgerow (Feature D) (September 4th, 2018).

Photograph 5: Looking west at the Deciduous Hedgerow (Feature E) (September 4th, 2018).

Photograph 6: Looking west at the Deciduous Hedgerow (Feature F) (September 4th, 2018).

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Photograph 7: Looking north at the Deciduous Hedgerow (Feature G) (September 4th, 2018).

Photograph 8: Looking south along March Valley Road, with the Deciduous Hedgerow (Feature H) at the right (September 4th, 2018).

Mixed Hedgerow (Feature I)

The western side of Mixed Hedgerow I is a planted line of Crack Willow between approximately 10 cm and 40 cm dbh in size. The eastern side of Mixed Hedgerow I is a planted line of White Spruce between approximately 20 cm and 40 cm dbh in size.

Photograph 9: Looking west at the Mixed Hedgerow (Feature I) (September 4th, 2018).

Coniferous Hedgerows (Features J to L)

There are three (3) Coniferous Hedgerows within the Site. These include the following:

- **Coniferous Hedgerow J:** Coniferous Hedgerow J consists of planted White Spruce between approximately 20 cm and 40 cm dbh in size.
- **Coniferous Hedgerow K:** Coniferous Hedgerow K consists of planted White Spruce between approximately 20 cm and 30 cm dbh in size.
- **Coniferous Hedgerow L:** Coniferous Hedgerow L consists of planted White Spruce between approximately 20 cm and 30 cm dbh in size. The feature is overgrown with Riverbank Grape and Wild Red Raspberry.

Photograph 10: Looking east at the Coniferous Hedgerow (Feature J) (September 4th, 2018).

Photograph 11: Looking south at the Coniferous Hedgerow (Feature K) (September 4th, 2018).

Photograph 12: Looking northeast at the Coniferous Hedgerow (Feature L) (September 4th, 2018).

Tree Stands (Features M & N)

There are two (2) isolated tree stands within the Site. These include the following:

- **Tree Stand M:** Tree Stand M consists of a small stand of trees which were planted around the farmhouse as landscaping features. Planted trees include White Spruce, White/Green Ash, Sugar Maple, and Trembling Aspen up to approximately 40 cm dbh in size. A planted Weeping Willow with a dbh of >1 m is also present, as is a 91 cm dbh Silver Maple.
- **Tree Stand N:** Tree Stand N is a small tree stand on the east side of March Road. The understory is sparse with very little shrub cover. Several mature Sugar Maples are present, as are younger White/Green Ash, American Elm, and White Cedar stems. The mature Sugar Maples include seven (7) trees measuring 71 cm, 47 cm, 56 cm, 53 cm, 84 cm, 64 cm, and 57 cm dbh. Shrub cover is sparse and includes Lilac.

Photograph 13: Looking south at the Tree Stand (Feature M). Note the mature Silver Maple and Weeping Willow (September 4th, 2018).

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Photograph 14: Looking west at the Tree Stand (Feature N). Note the presence of several mature Sugar Maples (September 4th, 2018).

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Woodlot S-20

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 Site, with the remainder of the feature occurring within the adjacent KNUEA Southeast Quadrant. Within the Site, Woodlot S-20 is divided into two (2) 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. Woodlot S-20 includes the following vegetation communities:

- **Fresh-Moist White Cedar Coniferous Forest (Feature O):** Feature O is a mature forest that is dominated by White Cedar, with White/Green Ash and American Elm well represented. Smaller numbers of Manitoba Maple and Butternut are also present, especially around the edges of the feature. The majority of White Cedar stems are relatively small (15 cm to 40 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 O 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 more than twenty (20) White Cedars, one (1) Red Maple, one (1) White Ash, and one (1) Bur Oak ≥50 cm dbh in size were identified (MEP 2016). Although several large trees are present, they represent the minority of stems. The measurements included below in Table B 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, Common 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.
- **Fresh-Moist Ash – Elm Deciduous Forest (West) (Feature P):** The northern part of Woodlot S-20 consists of a relatively young recent regrowth forest. As discussed above in Section 3.2, the majority of tree cover within Feature P appears to be less than approximately 20 years of age. Feature P is dominated by White/Green Ash between approximately 10 cm and 20 cm dbh in size. American Elm and Trembling Aspen between 10 cm and 30 cm dbh in size, and White Cedar between 10 cm and 20 cm dbh in size, are also well represented. Shrub cover is very thick and includes Red Osier Dogwood, Wild Red Raspberry, Slender Willow, Common Buckthorn, Chokecherry, and young ash stems. Much of the groundcover is reflective of disturbed conditions with Meadow Grass, Tall Buttercup, Canada Goldenrod, Red Clover, Common Strawberry, Small White Aster, Doll's Eyes, Wild Cucumber, White Snakeroot, Sensitive Fern, Poison Ivy, Tufted Vetch, Yellow Sorrel, White Avens, Daisy Fleabane, Common Dandelion, and Virginia Creeper.

WOODLOT S-20 LARGE TREE INVENTORY

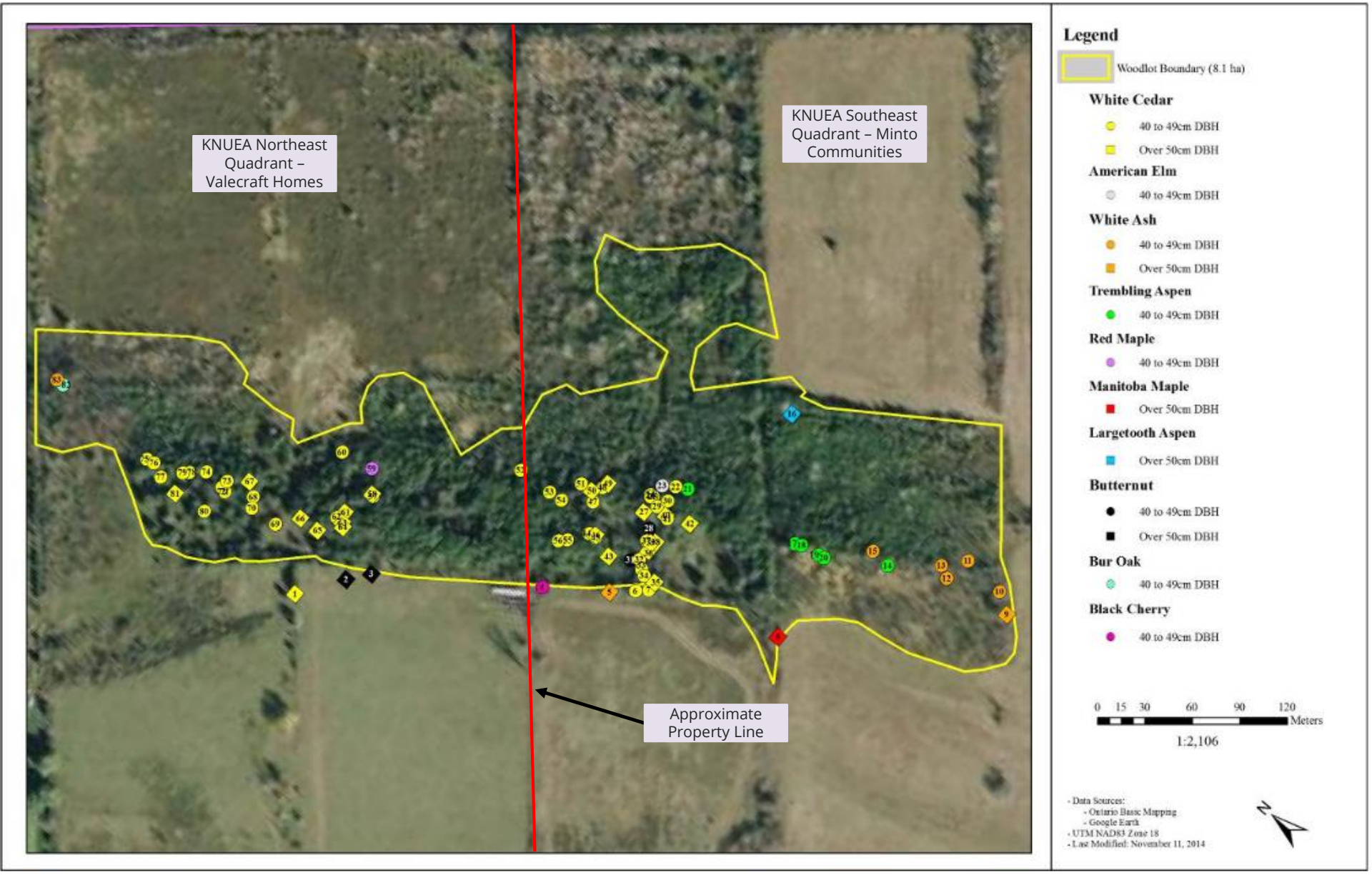

Figure taken from Muncaster Environmental Planning (2016)

Table B: Woodlot S-20					
Common Name	**Scientific Name**	**Average DBH**	**DBH Standard Deviation**	**% Occupancy**	**Estimated Stems Per Hectare***
Fresh-Moist Ash - White Cedar Coniferous Forest (Feature O) (5 Plots)					
White Cedar	*Thuja occidentalis*	25	15	87%	5400
American Elm	*Ulmus americana*	19	9	9%	560
White/Green Ash	*Fraxinus americana/pennsylvanica*	21	3	2%	120
Manitoba Maple	*Acer negundo*	21	1	1%	80
Butternut	*Juglans cinerea*	27	N/A	1%	40
Fresh-Moist Ash - Elm Deciduous Forest - West (Feature P) (2 Plots)					
White/Green Ash	*Fraxinus americana/pennsylvanica*	15	4	61%	1700
American Elm	*Ulmus americana*	16	9	25%	700
Trembling Aspen	*Populus tremuloides*	22	10	7%	200
White Cedar	*Thuja occidentalis*	10	4	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.

Photograph 15: Looking east at the western edge of the Fresh-Moist White Cedar Coniferous Forest (Feature O) (September 4th, 2018).

Photograph 16: Looking north at the western edge of the Fresh-Moist White Cedar Coniferous Forest (Feature O). The Deciduous Hedgerow (Feature C) is visible in the background (September 14th, 2018).

Photograph 17: Looking west at the eastern edge of the Fresh-Moist White Cedar Coniferous Forest (Feature O) (September 4th, 2018).

Photograph 18: Interior of the Fresh-Moist White Cedar Coniferous Forest (Feature O) (September 4th, 2018).

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Photograph 19: Looking south at the edge of the Fresh-Moist Ash – Elm Deciduous Forest (West) (Feature P). Note the large number of dead ash stems (September 4th, 2018).

Willow Shrub Thicket (Feature Q)

Feature Q is a Willow Shrub Thicket dominated by shrubs including Slender Willow, Bebb's Willow, Glossy Buckthorn, Wild Red Raspberry, and Red Osier Dogwood. Common Buckthorn, Chokecherry, and Prickly Ash are also present. Groundcover includes Reed Canary Grass, Purple Loosestrife, Blue Vervain, Spotted Joe Pye Weed, and White Gentian. Sparse Trembling Aspen, American Elm, and White/Green Ash stems between 10 cm to 25 cm dbh are present. Tree density increases in the southeast corner of the feature, where a stand of mature Trembling Aspen is present.

Photograph 20: Looking southeast at the edge of the Willow Shrub Thicket (Feature Q) (September 4th, 2018).

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Woodlot S-23

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 Site, with the remainder of the feature occurring within the adjacent KNUEA Southeast Quadrant. Within the Site, Woodlot S-23 and the surrounding recent regrowth communities are divided into two (2) 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. As described above in Section 3.2, the historic air photos indicate that the majority of tree cover within the portions of Woodlot S-23 that overlap the Site is between approximately 20 to 30 years of age. In contrast, the southwest portion of Woodlot S-23, which occurs within the adjacent KNUEA Southeast Quadrant, includes trees which are greater than 40 years of age. Woodlot S-23 includes the following vegetation communities:

- **Fresh-Moist Poplar Deciduous Forest (Feature R):** The Fresh-Moist Poplar Deciduous Forest (Feature R) is dominated by Trembling Aspen that vary in size between approximately 15 cm to 45 cm dbh. American Elm and White/Green Ash are well represented and vary in size between approximately 10 cm and 30 cm dbh. Relatively young Sugar Maple, White Birch, Bur Oak, Red Maple and Butternut are also present. Red Osier Dogwood, Prickly Ash, Tartarian Honeysuckle, Wild Red Raspberry, and Common Buckthorn shrubs are common. The understory includes Sensitive Fern, White Snakeroot, Riverbank Grape, Virginia Creeper, Philadelphia Fleabane, Canada Goldenrod, White Trillium, Jack in the Pulpit and Common Horsetail.
- **Fresh-Moist Ash – Elm Deciduous Forest (East) (Feature S):** Feature S is dominated by White/Green Ash and American Elm between approximately 10 cm and 25 cm dbh in size. Manitoba Maple and Bur Oak between 10 cm and 20 cm dbh in size are also well represented. Stands of young Trembling Aspen are also present in some areas. Shrub cover is very thick and includes Red Osier Dogwood, Wild Red Raspberry, Prickly Ash, Common Buckthorn, Glossy Buckthorn, Hawthorn, Chokecherry, Domestic Apple, and young ash and Manitoba Maple stems. Much of the groundcover is reflective of disturbed conditions with Meadow Grass, Tall Buttercup, Canada Goldenrod, Red Clover, Common Strawberry, Small White Aster, Doll's Eyes, Wild Cucumber, White Snakeroot, Sensitive Fern, Poison Ivy, Tufted Vetch, Yellow Sorrel, White Avens, Daisy Fleabane, Common Dandelion, Common Burdock, Common Milkweed, Hog Peanut, Wild Parsnip, Elecampane, Canada Anemone, Philadelphia Fleabane, Riverbank Grape, and Virginia Creeper.

Table C: Woodlot S-23					
Common Name	**Scientific Name**	**Average DBH**	**DBH Standard Deviation**	**% Occupancy**	**Estimated Stems Per Hectare***
Fresh-Moist Poplar Deciduous Forest (Feature R) (3 Plots)					
Trembling Aspen	*Populus tremuloides*	30	14	39%	804
White/Green Ash	*Fraxinus americana/pennsylvanica*	20	9	32%	670
American Elm	*Ulmus americana*	13	4	19%	402
Sugar Maple	*Acer saccharum*	13	N/A	3%	67
White Birch	*Betula papyrifera*	13	N/A	3%	67
Butternut	*Juglans cinerea*	18	N/A	3%	67
Fresh-Moist Ash - Elm Deciduous Forest - East (Feature S) (3 Plots)					
White/Green Ash	*Fraxinus americana/pennsylvanica*	17	6	46%	871
American Elm	*Ulmus americana*	15	4	39%	737
Manitoba Maple	*Acer negundo*	9	1	11%	201
Bur Oak	*Quercus macrocarpa*	22	N/A	4%	67

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.

Photograph 21: Looking west at the edge of the Fresh-Moist Poplar Deciduous Forest (Feature R) (September 4th, 2018).

Photograph 22: Looking east at the edge of the Fresh-Moist Ash – Elm Deciduous Forest (Feature S) (September 4th, 2018).

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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 Site) and the KNUEA Southeast Quadrant (the adjacent property). The following is a summary of the Significant Woodlot criteria for Woodlot S-20 (OMNRF 2010):

- **Woodland Size Criteria** – The Site 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 (e.g. The Willow Shrub Thicket – Feature Q). However, even if all connected trees and thicket habitats are 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 Site 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, particularly within the southern portion of the feature (e.g. within the KNUEA Southeast Quadrant). 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 Site, 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). The City of Ottawa does not show Woodlot S-20 as a natural heritage feature within the City of Ottawa's Natural Heritage System Overlay (City of Ottawa 2014). As discussed in greater detail in Section 4.1.1, the KNUEA EMP identified that a stand of mature White Cedar Trees should be preserved within the development area (Novatech 2016b). The stand of mature White Cedar Trees includes a portion of the Fresh-Moist White Cedar Coniferous Forest (Feature O). The stand of White Cedar Trees will be preserved within the Park Block (Block 309).

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 Site) and the KNUEA Southeast Quadrant (the adjacent property). 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). 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 Site 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 Site 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 Site, 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 of age. However, the portion of Woodlot S-23 that is shown to be older than 40 years of age in the historic air photos occurs in the adjacent KNUEA Southeast Quadrant (the southwest portion of the forest). As discussed above in Section 3.2, the portions of Woodlot S-23 that occur within the Site (the KNUEA Northeast Quadrant) are approximately 20 to 30 years old. A relatively high density of older trees is present within the southwestern part of the feature (MES 2018). 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). During breeding bird surveys completed in the spring and summer of 2018 within the KNUEA Southeast Quadrant, Eastern Wood Pewee were again found calling within Woodlot S-23 (MES 2018). In both instances, Eastern Wood Pewee were found in the southwest part of Woodlot S-23 (e.g. within the KNUEA Southeast Quadrant). To date, no Eastern Wood Pewee have been noted within the portions of Woodlot S-23 that occur within the Site (the KNUEA Northeast Quadrant). Due to the fact that Eastern Wood Pewee is a species of special concern, its presence results in the southwestern 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 Site and the KNUEA Southeast Quadrant (Novatech 2016b). As described above in Section 1.4, a Stormwater Management (SWM) Pond will be installed within the eastern portion of Woodlot S-23. The limits of the retained area of Woodlot S-23 will depend on the final

detailed design of the SWM Pond. As described above in Section 2.0.1, a large tree inventory will be undertaken in the summer of 2019. The large tree inventory will identify the location, condition, and species of trees ≥50 cm dbh within Woodlot S-23. The large tree inventory will help guide the detailed design process for the SWM pond. It is anticipated that the core of Woodlot S-23 will ultimately be retained. The KNUEA EMP specifies that the proposed inlet channels to the new SWM pond will be built outside the limits 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 southwestern 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 within both the Site and the adjacent KNUEA Southeast Quadrant 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 Site is dominated by open habitats including Cultivated Fields and Fallow Agricultural Fields. Farming within the Site is continuously rotated between the fields, such that a portion of the agricultural fields are fallow at any given time. Figure 3 reflects the extent of cultivation observed during the September 2018 field surveying. Fallow Agricultural Fields that are graminoid dominated are shown separately in Figure 3 compared to those that are forb dominated. Generally, graminoid dominated fallow fields have been cultivated more recently (e.g. within the previous year) and are in the early stages of regeneration. The forb dominated fallow fields were cultivated less recently (e.g. within the previous few years) and have regenerated to a greater extent. Open habitats include the following:

- **Cultivated Fields:** Areas under cultivation in 2018 are shown in Figure 3. All fields were planted with soybeans in 2018 with the exception of a small berry farm located in the western part of the Site, a small apple orchard located south of the former farmhouse location, and the adjacent mowed lawn (which is shown as cultivated in Figure 3).
- **Fallow Agricultural Fields (Graminoid Meadow):** Three (3) large patches of graminoid dominated Fallow Agricultural Fields are present in the northern part of the Site. The graminoid dominated Fallow Agricultural Fields are dominated by grasses including Meadow Grass, Blue Grass, Orchard Grass and Brome Grass. Herbaceous and forb plants include Canada Anemone, Timothy, White Bedstraw, Bird's Foot Trefoil, Queen Anne's Lace, Ox-eye Daisy, Common Strawberry, White Avens, Common Buttercup, Common Speedwell, Self-Heal, Tufted Vetch, New England Aster, Bladder Campion, Sow Thistle, Common Plantain, Red and White Clover, and Dandelion. Due to recent cultivation, the graminoid dominated fallow fields predominantly lack tree and shrub cover.
- **Fallow Agricultural Fields (Forb Meadow):** Four (4) patches of forb dominated Fallow Agricultural Fields are present throughout the Site. The forb dominated Fallow Agricultural Fields are dominated primarily by Canada Goldenrod and Wild Parsnip. Grass species present include Reed Canary Grass, Meadow Grass, Blue Grass, Orchard Grass and Brome Grass. Other forb species 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, Canada 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, Common Ragweed, 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. However, patches of Wild Red Raspberry, Virginia Creeper, Slender Willow, Prickly Ash, Red Osier Dogwood and Common Buckthorn shrubs are present.

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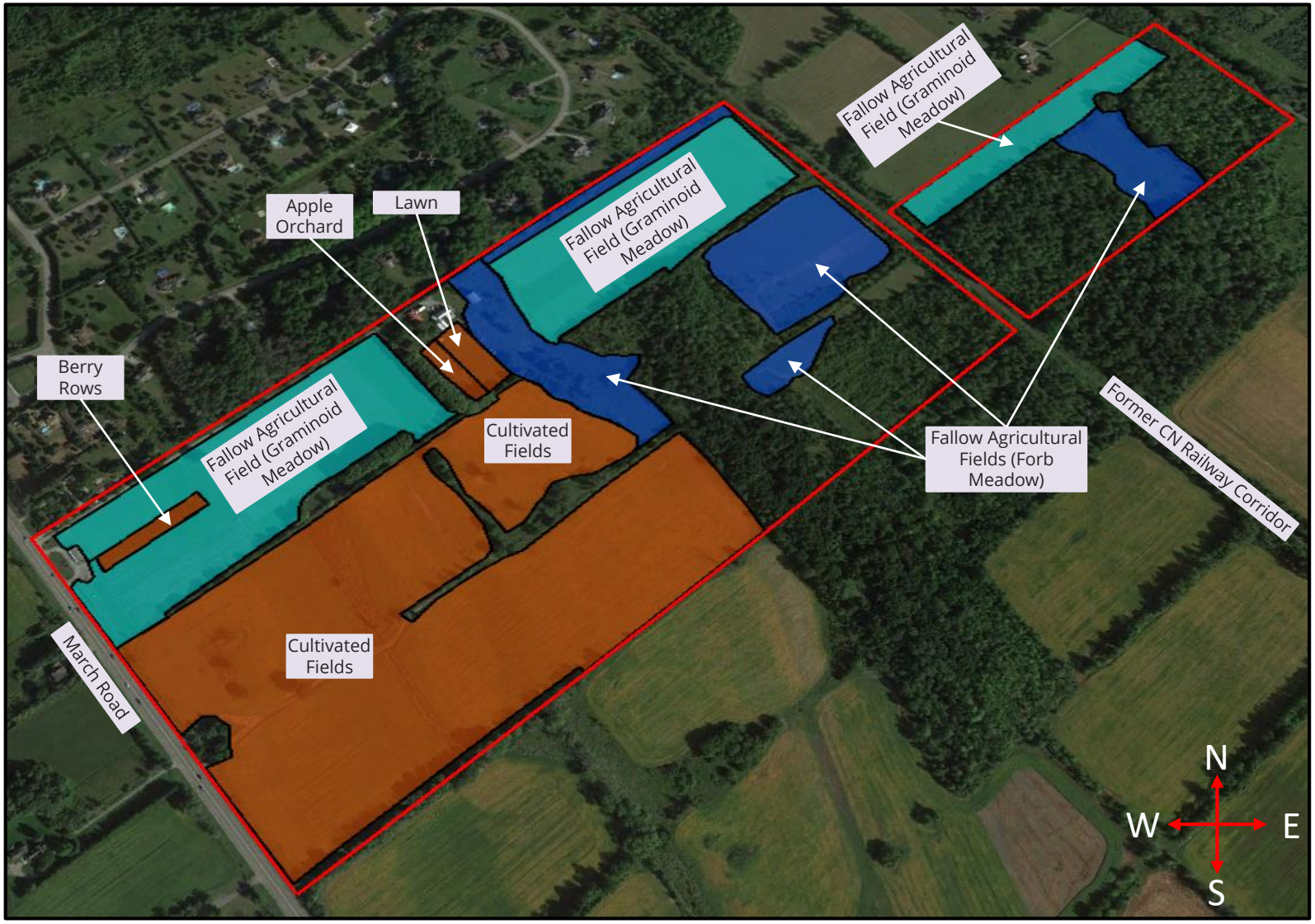
FIGURE 3: OPEN HABITATS

Valecraft Kanata North Development (1020 & 1070 March Road)
Combined Environmental Impact Statement and Tree Conservation Report



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

Photograph 23: Looking east from March Road at the Cultivated Field planted with soybeans (September 4th, 2018).

Photograph 24: Looking north at the small Apple Orchard (September 4th, 2018).

Photograph 25: Looking east from March Road at the Fallow Agricultural Field (Graminoid Meadow) in the northwest corner of the Site (September 4th, 2018).

Photograph 26: Looking west from the Former CN Railway Corridor at the Fallow Agricultural Field (Graminoid Meadow) in the north-central part of the Site (September 4th, 2018).

Photograph 27: Looking south at the Fallow Agricultural Field (Forb Meadow) located west of the Former CN Railway Corridor (September 4th, 2018).

Photograph 28: Looking south at the Fallow Agricultural Field (Forb Meadow) located east of the Former CN Railway Corridor (September 4th, 2018).

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 in a north-south direction within the roadside ditch of March Road, parallel to the western Site boundary (Refer to Figure 4). At the southwest corner of the Site, the North Tributary turns and flows in a west-east direction along the southern Site boundary. Approximately 180 m east of March Road, the Northern Field Drainage Channel merges with the North Tributary, beyond which the North Tributary turns south and flows into the Southeast Quadrant of the KNUEA. 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). Block 311 has been designated in order to accommodate the minimum 40 m wide corridor surrounding the North Tributary. The KNUEA EMP also identifies that during development of the Site, the portion of the North Tributary which flows within the roadside ditch of March Road is to be realigned approximately 20 m east of March Road. The realignment of the North Tributary is anticipated to result in an improvement in the quality of aquatic and riparian habitat for Blanding's Turtles, amphibians, fish, and other wildlife. During the realignment process, habitat restoration and enhancement works will be undertaken. The realignment and habitat enhancement works are described in greater detail in Section 4.2.2.

The portion of the North Tributary that flows within the March Road roadside ditch is heavily degraded as a result of siltation, salt, noise, and other disturbance from the road. The roadside portion of the North Tributary has been channelized within the ditch and is relatively fast flowing. Very little riparian woody vegetation is present adjacent to March Road. At the southwest corner of the Site, the North Tributary turns east, flowing parallel to the southern Site boundary. Where it flows along the southern Site boundary, the banks of the North Tributary are predominantly treed. As discussed above in Section 3.3, Deciduous Hedgerow B is present on the north bank (within the Site). A Deciduous Hedgerow is also present on the south bank (within the adjacent KNUEA Southeast Quadrant). As described in greater detail in Section 3.3, Deciduous Hedgerow B is dominated by White/Green Ash between approximately 20 cm and 35 cm dbh in size. Most of the White/Green Ash are either dead or dying. Bur Oak, Basswood, and Manitoba Maple are also well represented, with each varying in size between approximately 10 cm and 30 cm dbh. Tree cover on the south bank (within the adjacent KNUEA Southeast Quadrant) 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.

Upstream connection and the bulk of water flow is contributed from the upstream areas of the North Tributary. While overland flow from within the Site likely contributes to the North Tributary hydrology,

overall the bulk of water flow originates from upstream areas. Within the Site, the roadside portion of the North Tributary passes through three (3) stacked 60 cm CSP culverts that run under an old farm driveway east of March Road. Otherwise, there are no significant obstructions to flow within the Site, and hence no significant ponding occurs. 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 substrate of the roadside portion of the North Tributary consists of grass growth and areas of exposed silt and cobble. The substrate of the portion of the North Tributary that flows parallel to the southern Site boundary is generally dominated by silt/muddy bottom and woody debris. Due to the shade created by the adjacent riparian vegetation, in-stream cover is generally limited within the portion of the North Tributary that flows parallel to the southern Site boundary. In some areas this includes patches of Reed Canary Grass, Purple Loosestrife, Common Cattail, and Spotted Touch Me Not.

A drainage channel intersects with the North Tributary approximately 180 m east of March Road (the Northern Field Drainage Channel). The Northern Field Drainage Channel consists of a depression that conveys surface drainage to the North Tributary. The Northern Field Drainage Channel was not identified as a significant natural heritage feature during the previous KNUEA studies, and hence was not identified for retention (MEP 2016; Novatech 2016b). The Northern Field Drainage Channel was not observed to have significant surface water during the September 2018 Site visits, and is likely dry throughout most of the year. The channel likely conveys limited surface water during the spring melt and following major storm events. The Northern Field Drainage Channel was observed to be largely overgrown with Reed Canary Grass, Rough Sunflower, Canada Anemone, Purple Loosestrife, and Common Cattail in September 2018.

As described above in Section 2.0.3, a detailed Headwaters Drainage Assessment (HDA) will be completed in the spring and summer of 2019. The HDA will provide additional detail regarding the features outlined above. The HDA will be undertaken to support the proposed realignment of the North Tributary, and will include detailed surveying of the North Tributary and the Northern Field Drainage Channel.

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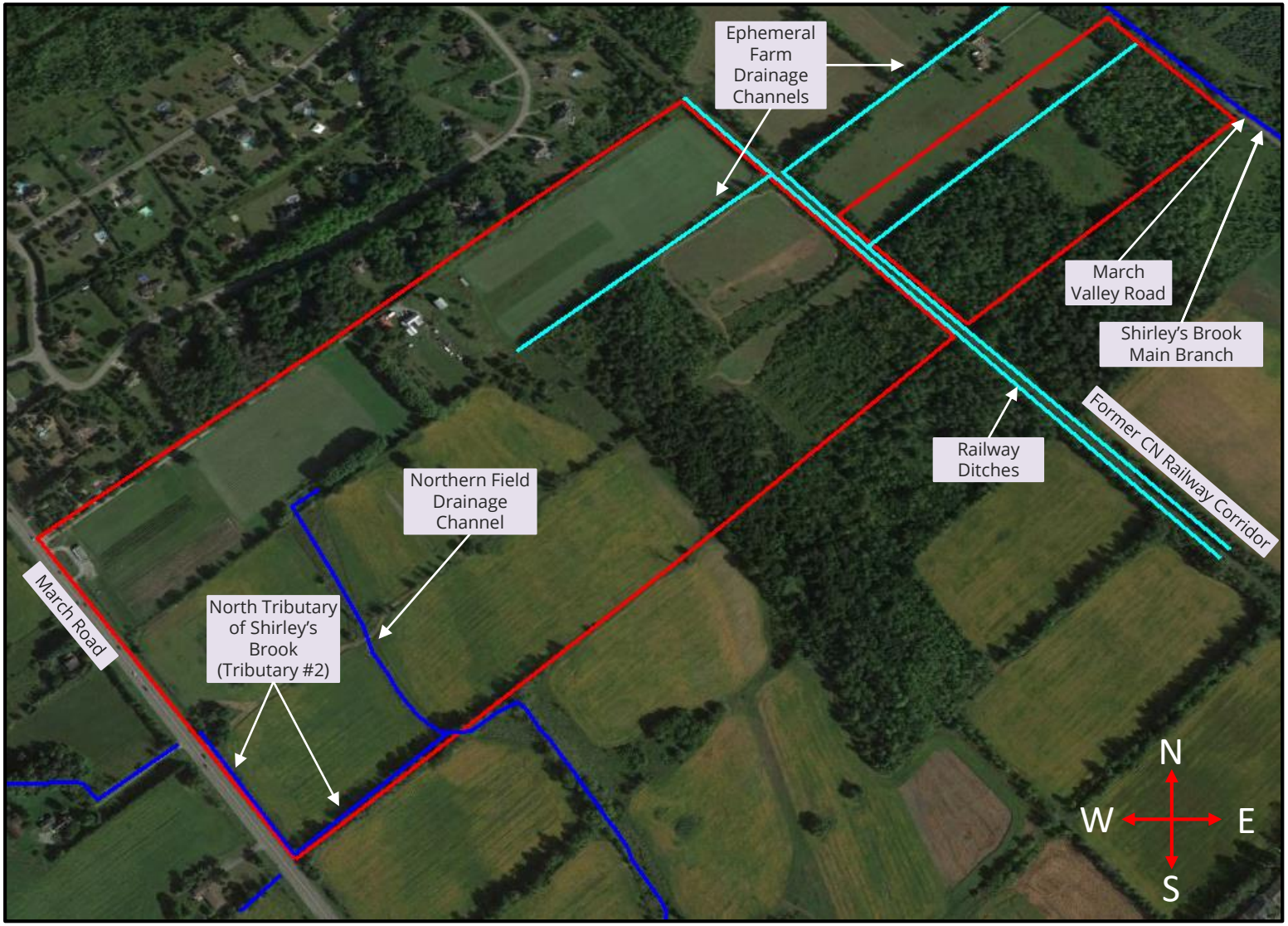
FIGURE 4: AQUATIC HABITATS

Valecraft Kanata North Development (1020 & 1070 March Road)
Combined Environmental Impact Statement and Tree Conservation Report



- Site Boundary

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

Photograph 29: Looking south at the North Tributary (Tributary #2) of Shirley's Brook where it passes through the eastern March Road ditch (September 4th, 2018).

Photograph 30: Looking east at the North Tributary (Tributary #2) of Shirley's Brook where it passes through Deciduous Hedgerow B (parallel to the southern Site boundary) (September 4th, 2018).

Photograph 31: Looking north at the Northern Field Drainage Channel (September 4th, 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 Site in order to provide surface drainage of the agricultural fields. The Ephemeral Farm Drainage Channels were evaluated by MEP (2016) as part of the KNUEA Natural Environment Features Existing Conditions Report. MEP (2016) observed that little water was present within the Ephemeral Farm Drainage Channels in May and September 2013. No water was found to be present within the channels during the Site visits completed by MES in September 2018. 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 appear to 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 2016). As a result, the Ephemeral Farm Drainage Channels are dry for the majority of the growing season. 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).

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). MEP (2016) conducted surveys for fish within the Ephemeral Farm Drainage Channels in 2013 and found no evidence of fish habitat. Overall, the Ephemeral Farm Drainage Channels are not considered significant ecological features. Due to the lack of habitat functionality, 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).

As described above in Section 2.0.3, a detailed Headwaters Drainage Assessment (HDA) will be completed in the spring and summer of 2019. The HDA will provide additional detail regarding the features outlined above.

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3.4.3 Fish Habitat

In 2013, fish sampling was completed at five (5) locations along the North Tributary (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 roadside segment of the North Tributary will be realigned approximately 20 m east of March Road, during which habitat enhancement and restoration works will be undertaken. The realignment project is anticipated to result in a net improvement in the quality of fish habitat (discussed below in Section 4.2.2). Following completion of the realignment project, the North Tributary will be preserved within the minimum 40 m wide watercourse corridor, thereby maintaining the associated fish habitat. As noted above, no fish were documented within the Ephemeral Farm Drainage Channels during the 2013 fish surveying (MEP 2016). Due to the lack of habitat functionality, removal of the Ephemeral Farm Drainage Channels is unlikely to represent a significant negative impact in terms of the loss of fish habitat.

As described above in Section 2.0.3, a detailed Headwaters Drainage Assessment (HDA) will be completed in the spring and summer of 2019. The HDA will include updated fish surveying within the North Tributary and the Northern Field Drainage Channel.

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3.5 Adjacent Lands and Significant Features

March Road is located west of the Site, beyond which is the KNUEA Northwest Quadrant. The KNUEA Southeast Quadrant is located south of the Site. Both adjacent quadrants are scheduled for future subdivision development. The portions of Woodlot S-20 that occur within the adjacent KNUEA Southeast Quadrant have not been identified for retention (MES 2018). As such, development of the Site will not significantly negatively impact the portions of Woodlot S-20 that occur beyond the Site. The portions of Woodlot S-23 that are to be retained within the Site and within the adjacent Southeast Quadrant of the KNUEA will be adjacent to one another, and therefore development within the 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 Site, thereby providing separation between the Site and the natural heritage features located to the east. An existing rural estate subdivision is located north of the Site. As described below in Section 4.1.1, existing tree coverage along the northern development boundary will be retained and/or enhanced in order to provide privacy for the adjacent residential properties.

The presence of aquatic habitats within and adjacent to the Site is described above in Section 3.4. The presence of Significant Wildlife Habitat and Species at Risk habitat is described below in Sections 3.6 and 3.7. No other significant natural heritage features have been identified within the Site or in immediately adjacent lands.

3.6 Wildlife and Significant Wildlife Habitat

Wildlife and bird species noted during surveys of the Site are listed in Appendix B. As discussed below in Section 3.7, the habitat of threatened Blanding's Turtle was confirmed within the Site. Eastern Wood Pewee (Special Concern) were documented within Woodlot S-23 by MEP (2016). During breeding bird surveys completed in the spring and summer of 2018 within the KNUEA Southeast Quadrant, Eastern Wood Pewee were again found calling within Woodlot S-23 (MES 2018). In both instances, Eastern Wood Pewee were found in the southwest part of Woodlot S-23 (e.g. within the KNUEA Southeast Quadrant). To date, no Eastern Wood Pewee have been noted within the portions of Woodlot S-23 that occur within the Site (the KNUEA Northeast Quadrant). The habitat of Species at Risk (SAR) is considered Significant Wildlife Habitat (SWH) (Refer to Section 3.7 for additional detail) (OMNRF 2014b).

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) provides warm-water fish habitat. The North Tributary may also provide amphibian breeding habitat. The potential presence of amphibian breeding habitat will be investigated as part of the planned amphibian call surveys, which will be undertaken in the spring and summer of 2019 as a component of the Headwaters Drainage Assessment (Refer to Section 2.0.3). Both fish habitat and amphibian breeding habitat qualify as SWH, and therefore the North Tributary qualifies as a SWH feature (OMNRF 2014b). As discussed above in Section 3.4.2, no evidence of fish habitat was noted within the Ephemeral Farm Drainage Channels.

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 Site (OMNRF 2014b).

As described in Section 2.0.2, updated breeding bird surveys are planned in the spring and summer of 2019 in order to verify the presence/absence of nesting Bobolink, Eastern Meadowlark, Barn Swallows, and other species. Any additional breeding birds noted during the survey will be described in the addendum to this Combined EIS and TCR. The planned breeding bird survey points for the 2019 survey are shown below in Figure 5. During previous surveying within the Site, a total of fifty five (55) bird species were documented. This included several common species of migratory birds typically found in suburban and rural areas (including foraging Barn Swallow and nesting Eastern Wood Pewee, discussed below). Other wildlife observed within the Site included Eastern Grey Squirrel, Red Squirrel, Eastern Chipmunk, White Tailed Deer, Coyote, Common Raccoon, Groundhog, American Toad, Green Frog, Northern Leopard Frog, Snapping Turtle (Special Concern – discussed below), and Garter Snake. Beaver and Muskrat were also noted within the North Tributary.

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FIGURE 5: BIRD SURVEY POINTS

Valecraft Kanata North Development (1020 & 1070 March Road)
Combined Environmental Impact Statement and Tree Conservation Report

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

3.7 Species at Risk

3.7.1 Bobolink and Eastern Meadowlark

Bobolink have been documented within the Kanata North Urban Expansion Area (KNUEA) west of March Road, and MEP (2016) noted the potential for Bobolink to occur within the KNUEA east of March Road. Although MEP (2016) noted the potential for Bobolink to be found within the Site, nesting within the Site has not been confirmed. The *General Habitat Description for Bobolink* (OMNRF 2014e) describes suitable breeding habitat for Bobolink as natural tallgrass prairies, open meadows, pastures, fallow fields, and hayfields. Eastern Meadowlark are found in similar habitats (OMNRF 2014f). Both species generally prefer to nest in open habitats that are graminoid dominated (grass dominated). Neither species is likely to be found nesting in fields cultivated with soybeans and/or fallow fields that are overgrown and dominated by forbs.

As described above in Section 3.3.5, cultivation within the Site is continuously rotated, and hence the presence of fallow fields that may potentially be suitable for Bobolink and/or Eastern Meadowlark nesting varies from year to year. In 2018, three (3) Graminoid Meadows (Fallow Agricultural Fields) were present within the Site. Each of these fields was large enough to potentially attract nesting Bobolink and/or Eastern Meadowlark.

In order to verify the potential presence/absence of nesting Bobolink and/or Eastern Meadowlark, updated breeding bird surveys will be undertaken in the spring and summer of 2019 (Refer to Section 2.0.2). Following completion of the 2019 surveys, Bobolink and Eastern Meadowlark habitat (if any) will be mapped and described in the addendum to this Combined EIS and TCR. Any additional regulatory, mitigation, and habitat compensation requirements related to Bobolink and/or Eastern Meadowlark will be described in the addendum.

3.7.2 Butternut Trees (TCR)

An updated Butternut Health Assessment (BHA) was completed for the entire Site in 2018 (Appendix C). A total of 71 Category 2 Butternut Trees and 7 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 along the western edge of Woodlot S-20 and within Woodlot S-23. However, additional Butternut Trees are also present elsewhere within the Site. Potential impacts to Butternut Trees and regulatory requirements are discussed below in Section 4.4.2.

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FIGURE 6: BUTTERNUT LOCATIONS – WESTERN AREA

Valecraft Kanata North Development (1020 & 1070 March Road)

Combined Environmental Impact Statement and Tree Conservation Report

- Site Boundary
- Category 2 Butternut
- Category 3 Butternut

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

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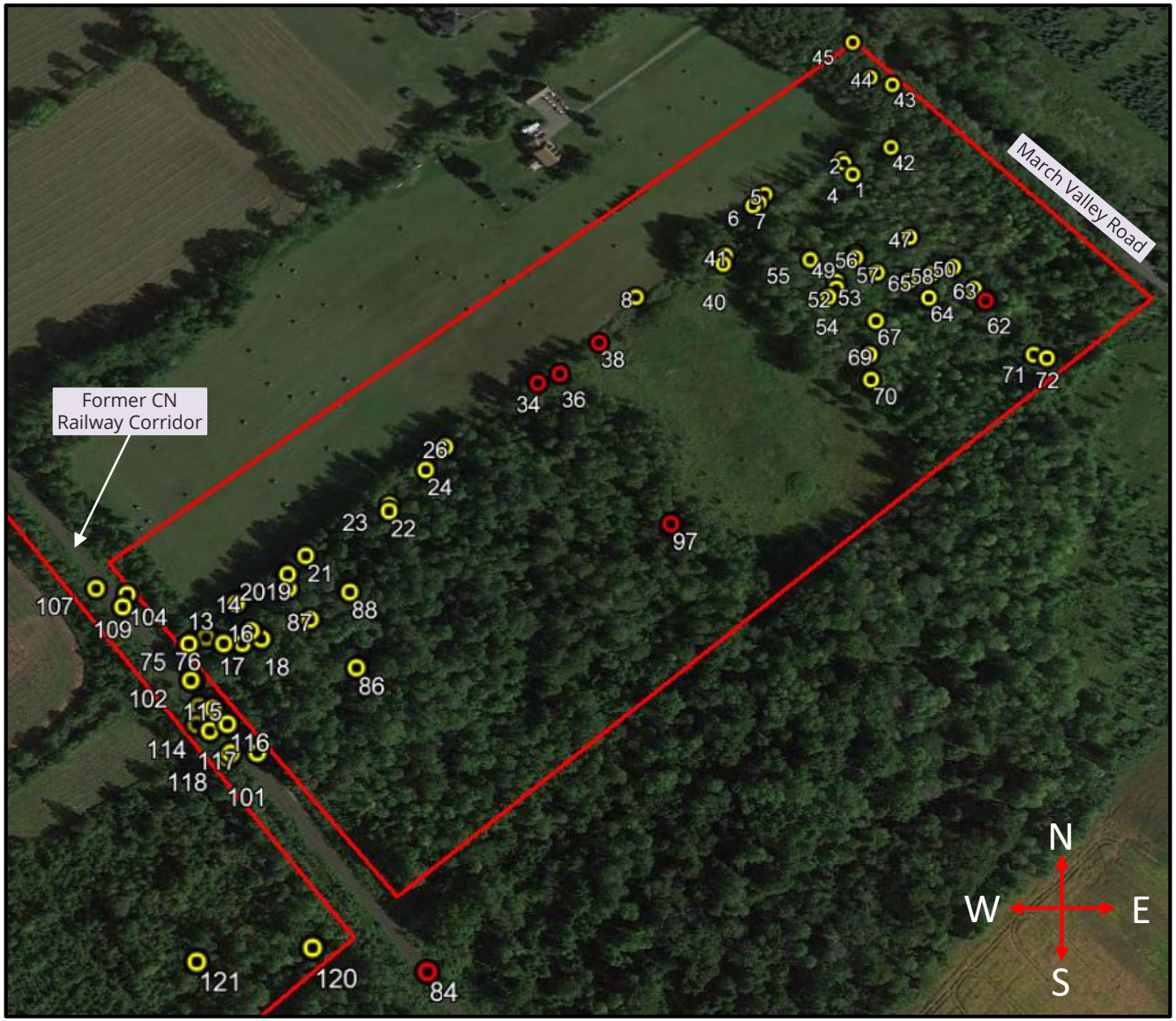
FIGURE 7: BUTTERNUT LOCATIONS – EASTERN AREA

Valecraft Kanata North Development (1020 & 1070 March Road)

Combined Environmental Impact Statement and Tree Conservation Report



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

3.7.3 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 of Shirley's Brook (Tributary #3) where the watercourse runs through the 910 March Road property. This suggests that Blanding's Turtle were continuing to utilize the tributaries of Shirley's Brook in the vicinity of the KNUEA Southeast Quadrant, as recently as 2017. The occurrence of confirmed Blanding's Turtle sightings within 2 km of the Site 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 EIS and TCR, as well as the future Overall Benefit Permit application (discussed in Section 4.4.3), 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 Site (DST 2015). There are no ponds within the Site which are likely to be 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 Site.

Under existing conditions, the total extent of Category 1 habitat shown within the Site 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 Northern Field Drainage Channel and the Ephemeral Farm Drainage Channels do not qualify as Category 2 habitat (DST 2015). Category 2 habitat is limited to the North Tributary and the surrounding area up to 30 m from the water's edge. The majority of Category 2 habitat that is found within the Site is considered low quality habitat (DST 2015). ***The total amount of Category 2 habitat shown within the Site under existing conditions is 1.27 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 Site adjacent to the tributaries of Shirley's Brook are shown as Category 3 habitat. This includes portions of the Site that are within 250 m of the North Tributary, as well as portions of the Site that are within 250 m of adjacent tributaries of Shirley's Brook found north and east of the Site. ***Approximately 21.87 ha of Category 3 habitat is present within the portion of the Site that occurs within the urban area (e.g. areas for future residential development). Approximately 4.99 ha of Category 3 habitat occurs within the rural area (e.g. east of the Former CN Railway Corridor). The total amount of Category 3 habitat shown within the Site under existing conditions is 26.86 ha (DST 2015).***

Potential impacts to Blanding's Turtle habitat and regulatory requirements are discussed below in Section 4.4.3.

425000 425500 426000 426500 427000 427500 428000

5024500 5024000 5023500 5023000

1.29 ha

Category 3 Habitat Remains Undeveloped

3.7 ha

March Valley Road

8.77 ha

Category 3 Habitat - Residential Blocks

Quadrant B - Valecraft

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

13.1 ha

March Road

Quadrant D - Metcalfe Realty Company Limited

Quadrant A - Junic/Multivesco

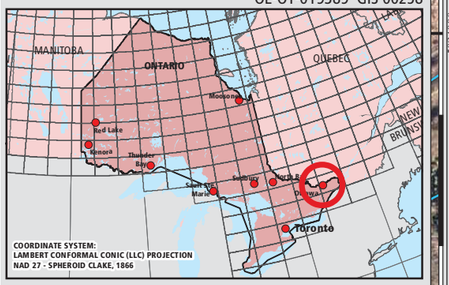
Quadrant C - Brigil

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

Chimney Swifts have not been observed foraging within the Site (MEP 2016). There are no buildings within the Site that have chimneys, and therefore there are no potentially suitable sites for Chimney Swift nesting. MEP (2016) have previously documented Barn Swallows foraging within the Site.

In order to verify the potential presence/absence of nesting Barn Swallows, updated breeding bird surveys will be undertaken in the spring and summer of 2019 (Refer to Section 2.0.2). During the breeding bird surveys, all buildings within the Site will be searched for the presence/absence of Barn Swallow nests. Following completion of the 2019 surveys, Barn Swallow habitat (if any) will be mapped and described in the addendum to this Combined EIS and TCR. Any additional regulatory, mitigation, and habitat compensation requirements related to Barn Swallows will be described in the addendum.

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3.7.5 Additional Species at Risk

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

- American Eel – Endangered
- Lake Sturgeon – Threatened
- Bank Swallow – Threatened
- Least Bittern – Threatened
- Black Tern – Special Concern
- Little Brown Bat – Endangered
- Northern Long Eared Bat – Endangered
- Eastern Small Footed Myotis – Endangered
- Tricolored Bat - Endangered
- Bald Eagle – Special Concern
- Eastern Wood Pewee – Special Concern
- Wood Thrush – Special Concern
- Snapping Turtle – Special Concern
- Monarch – Special Concern
- Eastern Whip Poor Will – Threatened

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

- **American Eel and Lake Sturgeon:** American Eel and Lake Sturgeon are fish species that are found in association with the Ottawa River (SARO 2019). The aquatic habitats within the Site are too small and too ephemeral to provide habitat for these species, and therefore American Eel and Lake Sturgeon are unlikely to be a significant concern for the proposed development.
- **Bank Swallow:** Bank Swallows nest in natural and artificial deposits of sand and silt with vertical faces (SARO 2019). There are no significant areas of exposed sand or silt within the Site and no stockpiles currently exist. No Bank Swallows were noted during the previously completed breeding bird surveys (MEP 2016). As such, Bank Swallows are unlikely to be a significant concern for the proposed development.
- **Least Bittern and Black Tern:** Least Bittern and Black Tern breed in open marshes and wetlands. As described above in Section 3.4, there are no significant areas of marsh or open wetland habitat

within the Site. Least Bittern and Black Tern are therefore unlikely to be a significant concern for the proposed development.

- **Little Brown Bat, Eastern Small Footed Myotis, Northern Long Eared Bat, and Tricolored Bat:** No caves, bedrock fissures, mining shafts, abandoned buildings, or other features which may function as bat hibernacula habitat were noted within the Site. The OMNRF (2011b) guidelines for bat surveying are outlined in the *Bats and Bat Habitats: Guidelines for Wind Power Projects*. These guidelines state that deciduous and mixed forest habitats have the potential to provide maternity roosting sites. 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 Site 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 Site to provide maternity roosting habitat:
    - **Fresh-Moist White Cedar Coniferous Forest (Feature O):** Feature O 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 Ash – Elm Deciduous Forest (West) (Feature P):** Feature P consists of a relatively young recent regrowth habitat. As discussed above in Section 3.2, the majority of tree cover within Feature P appears to be less than approximately 20 to 30 years of age. As noted in Table B, most trees are less than 25 cm dbh in size, and the density of trees greater than this size is likely too low to support potential maternity roosting habitat.
    - **Fresh-Moist Poplar Deciduous Forest (Feature R):** Feature R consists of a relatively young recent regrowth habitat. As discussed above in Section 3.2, the majority of tree cover within Feature R appears to be less than approximately 20 to 30 years of age. As noted in Table C, most trees are less than 25 cm dbh in size, and the density of trees greater than this size is likely too low to support potential maternity roosting habitat.
    - **Fresh-Moist Ash – Elm Deciduous Forest (East) (Feature S):** Feature S consists of a relatively young recent regrowth habitat. As discussed above in Section 3.2, the majority of tree cover within Feature S appears to be less than approximately 20 to 30 years of age. As noted in Table C, most trees are less than 25 cm dbh in size, and the density of trees greater than this size is likely too low to support potential maternity roosting habitat.
- **Bald Eagle:** Bald Eagles are a species of Special Concern, and therefore their habitat is not protected by the Ontario Endangered Species Act (ESA). Bald Eagles are primarily found nesting adjacent to large lakes and rivers (e.g. the Ottawa River) (SARO 2019). Due to the absence of large bodies of water in the vicinity of the Site, Bald Eagles are unlikely to be present. No evidence of Bald Eagles was noted during the previously completed breeding bird surveys (MEP 2016). As such, Bald Eagles are unlikely to be a significant concern for the proposed development.

- **Eastern Wood Pewee and Wood Thrush:** Eastern Wood Pewee and Wood Thrush both nest in mixed and deciduous forest (SARO 2019). As described previously, Eastern Wood Pewee were documented within Woodlot S-23 by MEP (2016). During breeding bird surveys completed in the spring and summer of 2018 within the KNUEA Southeast Quadrant, Eastern Wood Pewee were again found calling within Woodlot S-23 (MES 2018). In both instances, Eastern Wood Pewee were found in the southwest part of Woodlot S-23 (e.g. within the KNUEA Southeast Quadrant). To date, no Eastern Wood Pewee have been noted within the portions of Woodlot S-23 that occur within the Site (the KNUEA Northeast Quadrant). As discussed below in Section 4.1.1, the western portion of Woodlot S-23 has been identified for retention. No evidence of Wood Thrush was noted within the Site during the previously completed breeding bird surveys (MEP 2016). It should be noted that Eastern Wood Pewee are a species of Special Concern, and therefore their habitat is not protected under the Ontario ESA. The wildlife and Species at Risk mitigation measures discussed below in Section 4.4.6 are designed to mitigate potential impacts to individual Eastern Wood Pewees at the construction stage.
- **Snapping Turtle:** A Snapping Turtle was observed within the North Tributary within the Southeast Quadrant on June 21st, 2018 (MES 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 2019). As noted above, the North Tributary is considered Significant Wildlife Habitat due to the presence of Snapping Turtles 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 ESA. The wildlife and Species at Risk mitigation measures discussed in Sections 4.4.6 and 4.4.7 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 Site in association with the Fallow Agricultural Fields (Forb Meadow). However, the density of Common Milkweed was not high, and no Monarch Butterflies were noted within the Site during surveying. It should be noted that Monarch Butterflies are a species of special concern, and therefore their habitat is not protected under the Ontario ESA. The wildlife and Species at Risk mitigation measures discussed in Section 4.4.6 will help to mitigate any potential impacts to individual Monarch Butterflies at the construction stage.
- **Eastern Whip Poor Will:** Eastern Whip Poor Will call surveys were completed throughout the KNUEA in 2014 to support the 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 Eastern 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 Site generally does not provide the mosaic of half treed conditions preferred by Eastern Whip Poor Will. However, the OMNRF has identified Eastern Whip Poor Will as a potential concern. As such, updated surveying

for Eastern Whip Poor Will is planned for the spring and summer of 2019 (Refer to Section 2.0.2). The planned Eastern Whip Poor Will survey points are shown in Figure 8 (below).

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FIGURE 8: WPWI SURVEY POINTS

Valecraft Kanata North Development (1020 & 1070 March Road)
Combined Environmental Impact Statement and Tree Conservation Report

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

3.8 Linkages

Under existing conditions, March Road, March Valley Road, and the existing rural estates subdivision to the north of the Site represent barriers to wildlife movement. However, the predominantly agricultural nature of the Site likely allows wildlife to traverse the Site 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 Site as a movement corridor. However, less mobile species (including Blanding's Turtle) are likely to be more restricted in their movements within the Site, 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 Site for the majority of wildlife species.

Following the future development of the Site and the adjacent quadrants of the KNUEA, wildlife movement through the Site 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 minimum 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 Site is present within the various Coniferous, Mixed, and Deciduous Hedgerows (Features A to L), two (2) small isolated Tree Stands (Features M & N), within Woodlot S-20 and the surrounding areas of recent regrowth (Features O to Q), and within Woodlot S-23 and the adjacent areas of recent regrowth (Features R & S). 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 Northeast 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*;
- *It is recommended that the stand of healthy, mature White Cedars in the northwest corner of Woodlot S-20 be retained as part of the proposed parkland; 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 Site, the tree retention recommendations of the KNUEA EMP will be implemented as follows:

- Where feasible, trees will be preserved within the Open Space Block (Block 311) that provides the minimum 40 m wide corridor surrounding the North Tributary of Shirley's Brook. As discussed above in Section 3.4.1, few trees are currently present within the roadside segment of the North Tributary. Wherever feasible, Deciduous Hedgerow B will be retained within the minimum 40 m

wide watercourse corridor. The habitat enhancement measures will be placed to take advantage of existing openings (discussed below in Section 4.2.2);

- The KNUEA EMP identified that trees along the northern development boundary are to be retained and/or enhanced, in order to provide privacy for the adjacent rural estate homes. The Draft Plan of Subdivision includes deep lots (approximately 34 m deep) with single detached homes along the northern development boundary. The lots along the northern development boundary have been sized so that they are large enough to retain existing trees at the property line and also to accommodate additional tree planting (where required). Many of the adjacent properties along the northern development boundary are already well forested, and hence do not require additional plantings to provide privacy. However, enhancement plantings will be added at the back of lots along the northern development boundary wherever there is currently insufficient tree coverage within the adjacent properties to provide privacy;
- The KNUEA EMP identified that a stand of mature White Cedar Trees should be preserved (Novatech 2016b). The stand of White Cedar Trees includes a portion of the Fresh-Moist White Cedar Coniferous Forest (Vegetation Feature O). The stand of mature White Cedar Trees is included within the Park Block (Block 309);
- Where compatible with the school design, trees could also be preserved within the School Block (Block 310). However, it should be noted that within the KNUEA Northeast Quadrant, the EMP did not identify retention of the vegetation communities that overlap the future school site (Novatech 2016b). As such, tree retention within the school block 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 school. Portions of Deciduous Hedgerow C overlap the School Block (Block 310);
- The KNUEA EMP stated that the western portion of Woodlot S-23 is to be retained as a natural heritage feature and conveyed to the City (Novatech 2016b). The limits of the retained area of Woodlot S-23 will depend on the final detailed design of the SWM Pond. As described above in Section 2.0.1, a large tree inventory will be undertaken in the summer of 2019. The large tree inventory will identify the location, condition, and species of trees ≥50 cm dbh within Woodlot S-23. The large tree inventory will help guide the detailed design process for the SWM pond. It is anticipated that the core of Woodlot S-23 will ultimately be retained. The EMP specifies that the proposed inlet channels to the new SWM pond will be built outside the limits of Woodlot S-23; and
- The Site is anticipated to be developed in multiple phases over several years. However, it is anticipated that the entire 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. Plantings recommendations within the realigned North Tributary corridor are described below in Section 4.2.3.

As noted above, the lots along the northern development boundary have been sized so that they are large enough to retain existing trees at the property line and also to accommodate additional tree planting (where required). Many of the adjacent properties along the northern development boundary are already well forested, and hence do not require additional plantings to provide privacy. However, enhancement plantings will be added at the back of lots along the northern development boundary wherever there is currently insufficient tree coverage within the adjacent properties to provide privacy.

4.2 Watercourses and Aquatic Habitats

4.2.1 North 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 Site, Block 311 provides the minimum 40 m wide corridor surrounding the North Tributary. The KNUEA EMP also identifies that during development of the Site, the portion of the North Tributary which flows within the roadside ditch of March Road is to be realigned approximately 20 m east of March Road (discussed below).

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 additionally 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 Site, no significant slope and bank stability issues have been identified (Novatech 2016b). The retention of existing vegetation within the minimum 40 m wide corridor will help to minimize erosion potential.
B. **Natural Vegetation and Ecological Functions in the Setback Area:** Vegetation cover within the minimum 40 m wide 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 (and other wildlife).
C. **The Nature of the Abutting Waterbody and the Presence of the Floodplain:** The floodplain of the North Tributary will be confined within the minimum 40 m wide watercourse corridor following development of the Site (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 will be

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 corridor surrounding the North Tributary is anticipated to be sufficient to protect the ecological functions of the watercourse. 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 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. The Northern Field Drainage Channel is also not considered a significant ecological feature, and hence was also not identified for retention (Novatech 2016b).

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4.2.2 North Tributary Realignment – Aquatic Habitat Enhancement Features

The KNUEA Environmental Management Plan (EMP) identifies that during development of the Site, the portion of the North Tributary which flows within the roadside ditch of March Road is to be realigned approximately 20 m east of March Road (Novatech 2016b). Realignment of the North Tributary away from March Road is anticipated to help restore the habitat functionality of that portion of the watercourse by reducing the impacts of siltation, salt, noise, and other disturbance associated with the road. During the realignment process, habitat enhancement and restoration works will also be undertaken to provide additional ecological benefit. The habitat enhancement measures were designed primarily to improve the quality of the North Tributary as habitat for Blanding's Turtle (DST 2015). However, the habitat enhancement measures will also improve the quality of aquatic habitat for other organisms, including amphibians and fish. As discussed above in Section 3.4.1, the roadside section of the North Tributary can be characterized as highly degraded under current conditions. The North Tributary provides intermittent, low quality fish habitat, which supports a low diversity, tolerant warm-water fish community. As described above in Section 3.7.3, the North Tributary also provides low quality Category 2 habitat for Blanding's Turtle. It is anticipated that the habitat enhancement measures will be included within the future Overall Benefit Permit under the Ontario Endangered Species Act (ESA) for Blanding's Turtle, thereby partially offsetting the loss of Blanding's Turtle habitat associated with the development (discussed in greater detail below in Section 4.4.3). The Open Space Block (Block 311) will accommodate the realigned watercourse corridor (refer to the Draft Plan of Subdivision).

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 the realignment of the North Tributary. For the purposes of this Combined EIS and TCR, and the future Overall Benefit Permit application for Blanding's Turtle, typically a conceptual design for the watercourse realignment would be deemed sufficient. The conceptual design for the realignment is outlined below.

Typically the Overall Benefit Permit is obtained prior to initiating the detailed design process for a watercourse realignment, as the Overall Benefit Permit may contain provisions that need to be reflected in the final design. Following obtainment of the Overall Benefit Permit, a detailed design for the North Tributary realignment will be developed and submitted to the City, 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 realignment includes the following (Refer to DST (2015) and Novatech (2016b) for additional detail):

1. **Stream Corridor:** Areas where the existing channel will be realigned will be designed using natural channel design techniques to ensure long-term stability and enhance ecological functions of the corridor. This will include the following:

    a. Areas where the realigned channel bed is situated directly on bedrock will require geotechnical evaluation and measures to prevent excessive diversion of baseflows into rock fractures (if applicable).
    b. The low flow channel should have a bottom width of between 1 m and 4 m.
    c. The maximum bank angle within the wetted channel should be approximately 25 degrees (2:1) and the bank beyond the wetted channel should be approximately 10 to 15 degrees maximum (4:1 to 6:1) and should be nearly flat to 6 degrees (10% slope).
    d. Limited portions of the stream may have a steeper bank angle where final grades would require extensive excavation to create a shallow angle, but the majority of the watercourse will feature a shallow bank.
    e. The water depth profile will be similar to the existing channel, with bankfull depths ranging from 30 cm to 75 cm during periods of high water.
    f. Water depths will be less than 30 cm during low flow periods.

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 minimum 40 m wide watercourse corridor will be enhanced by including two (2) Shallow Pans/Shallow Pools, two (2) Deep Channel Pockets, and hard substrate habitat features within the watercourse corridor. The design for these features is as follows:

    a. **Shallow Pans/Shallow Pools** excavated around 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 will measure approximately 10 m wide (5 m on either side of the channel) 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 Channel 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 within the channel for turtles, fish and other aquatic wildlife.
    - Deep channel pockets will be relatively small (approximately 5 m diameter) and will be semi-randomly placed along the channel length.

c. **Hard Substrate Features** including woody debris, logs, root wads, and cut trees will be placed within wider sections of the channel (>2 m low flow bottom width). Woody debris, grubbed stumps, logs, flat rocks, rock piles and other cover materials will be interspersed along the banks of the realigned channel to create habitat within (or adjacent) to the main channel.

4.2.3 North Tributary Realignment - Riparian Planting (TCR)

The KNUEA EMP makes the following recommendations regarding planting requirements within the minimum 40 m wide watercourse corridor (Novatech 2016b):

- *Realigned channel sections should be seeded with a native wetland/riparian seed mix to encourage re-establishment of native vegetation and improve habitat quality*;
- *Where possible, the realigned channel sections should be designed to take advantage of existing shade trees and surrounding woody vegetation in hedgerows;*
- *Shade tree planting should be selective, as the goal is not to create a fully shaded riparian corridor. Landscaping and grading features will be identified at the detailed design stage to ensure that critical habitat areas are well separated from the adjacent recreational trails.*

The riparian planting recommendations of the EMP (Novatech 2016b) will be implemented as follows:

- Following completion of excavation and other earthworks, bare areas of the watercourse corridor will be seeded with a native wetland/riparian seed mix. Seeds will be broadcast over any bare areas in the early part of the growing season, in order to encourage the establishment of native wetland vegetation.
- As noted above, Deciduous Hedgerow B will be preserved within the minimum 40 m wide watercourse corridor, wherever feasible. There are few trees currently present within the north-south aligned portion of the corridor (adjacent to March Road).
- It is not desirable to completely reforest the watercourse corridor, as Blanding's Turtle require open areas with full sun for basking and thermal regulation. Complete reforestation of the watercourse corridor would make the habitat less suitable for Blanding's Turtle. However, trees growing within the watercourse corridor will 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 such, tree planting within the watercourse corridor is desirable, but should be undertaken selectively, with relatively few dense stands.
- During detailed design, landscaping and grading features will be identified to ensure that critical habitat areas are well separated from the adjacent 6 m wide recreational trail. Tree/shrub planting can be utilized as a visual barrier to ensure that some portions of the watercourse corridor remain undisturbed by recreational usage.

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 the eastern part of Woodlot S-23. The new SWM Pond will outlet clean water to Shirley's Brook east of March Valley Road. The KNUEA Environmental Management Plan (EMP) specifies that the proposed inlet channels to the new SWM pond will be built outside the limits of Woodlot S-23. The KNUEA 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).

As described above in Section 4.2.1, the Ephemeral Farm Drainage Channels and the Northern Field Drainage Channel are not considered significant ecological features, and hence they will be decommissioned during the development. As described above in Section 4.2.1, these features do not provide significant fish or amphibian habitat functionality. The primary effect that the removal of the Ephemeral Farm Drainage Channels and the Northern Field Drainage Channel may have on downstream areas would be a reduction in the flow of water and nutrients to downstream areas. These potential impacts can be addressed by implementing Low Impact Development (LID) mitigation measures. The following flow mitigation options are provided by the Toronto Region Conservation Authority (TRCA) (2014):

- Replicate on-site flow and outlet flows at the top end of the system to maintain feature functions with vegetated swales, bioswales, etc. If catchment drainage has been previously removed due to diversion of stormwater flows, restore lost functions through enhanced lot level controls (i.e. restore original catchment using clean roof drainage).
- Replicate functions by lot level conveyance measures (e.g. vegetated swales) connected to the natural heritage system, as feasible, and/or Low Impact Development (LID) stormwater options (refer to Conservation Authority Water Management Guidelines for details).

As described above in Section 2.0.3, a detailed Headwaters Drainage Assessment (HDA) will be completed in the spring and summer of 2019. The HDA will include additional detail regarding the proposed flow mitigation measures.

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 minimum 40 m wide watercourse corridor 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.

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 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.

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4.4 Wildlife and Species at Risk

4.4.1 Bobolink and Eastern Meadowlark Regulatory Requirements

As described in Section 3.7.1, in order to verify the potential presence/absence of nesting Bobolink and/or Eastern Meadowlark, updated breeding bird surveys will be undertaken in the spring and summer of 2019 (Refer to Section 2.0.2). Following completion of the 2019 surveys, Bobolink and Eastern Meadowlark habitat (if any) will be mapped and described in the addendum to this Combined EIS and TCR. Any additional regulatory, mitigation, and habitat compensation requirements related to Bobolink and/or Eastern Meadowlark will be described in the addendum.

4.4.2 Butternut Tree Impacts and Regulatory Requirements (TCR)

As described in Section 3.7.2, a total of 71 Category 2 Butternut Trees and 7 Category 3 Butternut Trees were identified within the Site. It is anticipated that several Category 2 and 3 Butternut Trees will be preserved within the retained portions of Woodlot S-20 and 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 Site will 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 Site will require an Overall Benefit Permit 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 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 Ministry of Environment, Climate Change, and Parks (MECP) through the permitting process.

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4.4.3 Blanding's Turtle Impacts and Regulatory Requirements

The following is a summary of the quantification of Blanding's Turtle habitat loss:

- As discussed above in Section 3.7.3, there are no areas of Category 1 Blanding's Turtle habitat known to exist within the Site.
- As described above in Section 4.2.2, the KNUEA Environmental Management Plan (EMP) requires the roadside segment of the North Tributary to be realigned approximately 20 m east of March Road (Novatech 2016b). Blanding's Turtle Category 2 habitat includes the watercourse itself, and surrounding terrestrial areas up to 30 m from the watercourse (on both sides), thereby creating a 60 m wide corridor of habitat surrounding the watercourse (in the absence of development). However, under existing conditions the width of Category 2 habitat associated with the roadside segment of the North Tributary is only 30 m wide, as the road occurs on the west side of the watercourse. By realigning the watercourse 20 m east of March Road (centering it within the minimum 40 m wide corridor within the Site), the width of Category 2 habitat associated with the roadside segment of the North Tributary will expand from 30 m wide to 40 m wide. Realigning the North Tributary away from March Road will hence result in a net increase in the extent of Category 2 habitat associated with that portion of the North Tributary.
- The Category 2 habitat found in association with the portion of the North Tributary that flows parallel to the southern property boundary is 60 m wide. As noted above in Section 4.2.1, the North Tributary will be contained within a minimum 40 m wide corridor following development. Reducing the watercourse corridor width to 40 m effectively removes an area of Category 2 habitat 10 m wide on either side of the North Tributary (10 m within the Site and 10 m within the KNUEA Southeast Quadrant).
- Taken together, the realignment of the roadside segment of the North Tributary will add an area of Category 2 habitat 10 m wide, while narrowing of the portion of the North Tributary that flows parallel to the southern property boundary will remove an area of Category 2 habitat 10 m wide. These alterations result in a net increase in the extent of Category 2 habitat of +0.26 ha (1.27 ha pre-development, 1.53 ha post development).
- As described above in Section 4.2.2, the realignment will also include habitat enhancement measures, including the addition of two (2) shallow pans/pools, and two (2) deep channel pockets. The shallow pans will each be approximately 600 m^2 in size and the deep channel pockets will each be approximately 20 m^2 in size, thereby adding approximately 0.12 ha of Category 2 habitat within the minimum 40 m wide watercourse corridor.
- As described in Section 3.7.3, the development of the residential subdivision will remove approximately 21.87 ha of Category 3 habitat.
- The development of the Stormwater Management Pond will remove an additional approximately 3.7 ha of Category 3 habitat.

- Approximately 1.29 ha of Category 3 habitat will remain undeveloped in the rural area of the Site (north of the Stormwater Management Pond).

In summary, the net loss of habitat associated with the proposed development will include the following:

- **Category 1 Habitat:** No habitat present
- **Category 2 Habitat:** +0.26 ha (Net Impact of Watercourse Realignment and 40 m Corridor) + 0.12 ha (Habitat Enhancement Measures) = +0.38 ha
- **Category 3 Habitat:** -21.87 ha (Residential Subdivision Habitat Loss) – 3.7 ha (SWM Pond) = -25.57 ha

The net gain in Category 2 habitat, which results both from the realignment of the North Tributary and the habitat enhancement measures, will help to mitigate the loss of Category 3 habitat. Although 25.57 ha of Category 3 habitat is anticipated to be removed by the development, it should be noted that 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.

DST (2015) discusses in detail how the potential loss of habitat may impact the regional population of Blanding's Turtles. As noted above in Section 3.7.3, comparatively few Blanding's Turtles have been found within the KNUEA. The existing Category 2 habitat within the Site is comparatively small and degraded, and the Site provides 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 Site 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 Site 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 habitat and Butternut Trees, an Overall Benefit Permit 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 Site, it is anticipated that both species will be addressed through a combined permit application. The Overall Benefit Permit will require the proponent 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 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 Site) has been discussed. This may help to reduce road mortality, and 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 Ministry of Environment, Climate Change, and Parks (MECP), through the Overall Benefit Permit application and review process. Mitigation measures to protect individual Blanding's Turtles during development are discussed below in Sections 4.4.6 and 4.4.7.

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 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 minimum 40 m wide North Tributary corridor. Fencing will be required to tie into the adjacent Blanding's Turtle exclusion fencing that is to be installed to the south within the KNUEA Southeast Quadrant.

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 the 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 specific requirements for permanent fencing will be outlined by the Overall Benefit Permit at the detailed design stage.

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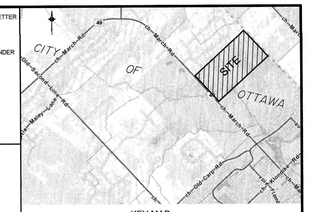
SUBJECT TO THE CONDITIONS, IF ANY, SET FORTH IN OUR LETTER DATED

_____

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 MAP
NOT TO SCALE

DRAFT PLAN OF SUBDIVISION OF

PART OF LOT 13
CONCESSION 4
Geographic Township of March
CITY OF OTTAWA

Prepared by Annis , O'Sullivan , Vollebekk Ltd.

Scale 1 : 1000

40 30 20 10 0 20 40 Metres

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

SURVEYOR'S CERTIFICATE

I CERTIFY THAT :
The boundaries of the lands to be subdivided and their relationship to adjoining lands have been accurately and correctly shown.

_____ Date

_____ V. Andrew Shelp
ONTARIO LAND SURVEYOR

OWNER'S CERTIFICATE

This is to certify that we are the owners of the lands to be subdivided and that this plan was prepared in accordance with our instructions.

_____ Date

_____ Danny Page, Manager of Planning
Valecraft Homes Ltd.
I have the authority to bind the corporation.

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51-17 OF THE PLANNING ACT

(a) see plan
(b) see plan
(c) see plan
(d) single, multi-family residential housing, institutional, commercial / mixed use, park and open space
(e) see plan
(f) see plan
(g) see plan
(h) City of Ottawa
(i) see soils report
(j) see plan
(k) sanitary, storm sewers, municipal water, bell, hydro, cable and gas to be available
(l) see plan

Fencing to tie into the existing box culvert at March Road

Fencing to connect to the adjacent 40 m wide corridor fencing within the KNUEA Southeast Quadrant

Sketch of Temporary and Permanent Blanding's Turtle Fencing Locations (Red Lines)

REVISION SCHEDULE			
NO.	REVISION	DATE	BY
5	REMOVED ST. IS WITH LOT/BLK REVISION	APR 11, 2019	N
4	NEW STREET IS WITH LOT/BLK REVISION	MAR. 19, 2019	DG
3	REVISIONS PER EMAIL / ENG REVIEW	MAR. 15, 2019	N
2	REVISIONS	MAR. 5, 2019	N
1	PLAN PREPARED	2019	N

ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
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Phone: (613) 727-0850 / Fax: (613) 727-1079
Email: Nepean@aovltd.com

Ontario Land Surveyors

Job No. 18096-III Valecraft Pt Lt 13 C4 MA DPS.DS 00

4.4.5 Barn Swallow Regulatory Requirements

As described in Section 3.7.4, in order to verify the potential presence/absence of nesting Barn Swallows, updated breeding bird surveys will be undertaken in the spring and summer of 2019 (Refer to Section 2.0.2). During the breeding bird surveys, all buildings within the Site will be searched for the presence/absence of Barn Swallow nests. Following completion of the 2019 surveys, Barn Swallow habitat (if any) will be mapped and described in the addendum to this Combined EIS and TCR. Any additional regulatory, mitigation, and habitat compensation requirements related to Barn Swallows will be described in the addendum.

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4.4.6 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 measures within the minimum 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 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 Species at Risk (SAR) are encountered in the work area, construction in the vicinity must be stopped immediately and measures must be taken to ensure the SAR is not harmed. The project biologist and the OMNRF/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.

4.4.7 Species at Risk and Wildlife Construction Stage Mitigation - Aquatic

In addition to the 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 the decommissioning of the old alignment of the North Tributary (e.g. the portion of the watercourse that occurs within the March Road roadside ditch), a *Wildlife Scientific Collector's Authorization* and *License to Collect Fish for Scientific Purposes* must be obtained from the 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 the 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;
- **Inspections:** Once dewatering is complete, weekly construction stage inspections by a Qualified Biologist must be undertaken throughout the duration of the realignment of the North Tributary of Shirley's Brook, and during the installation of all habitat enhancement measures; and
- **Shirley's Brook Decommissioning:** Decommissioning of portions of the current alignment of the North Tributary of Shirley's Brook (e.g. the portion of the watercourse that occurs within the March Road roadside ditch) must occur during the Blanding's Turtle overwintering season, which is between October 16th and April 15th.

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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 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.

6.0 ADDITIONAL STUDIES

As described above in Section 2.0.1, a follow-up large tree inventory will be undertaken in the summer of 2019. The large tree inventory will identify the location, condition, and species of trees ≥50 cm dbh within Woodlot S-23. Additional targeted Species at Risk surveying will also be completed in the spring and summer of 2019. As discussed in Section 2.0.2, this will include an updated breeding bird survey to confirm the presence/absence of nesting Bobolink, Eastern Meadowlark, and Barn Swallows, as well as an updated Eastern Whip Poor Will Call survey. Spring and summer Species at Risk survey results, and the results of the large tree inventory, will be provided to the City through an addendum to this Combined EIS and TCR. The addendum will discuss the survey methods, findings, and any additional potential impacts, mitigation requirements, and/or regulatory requirements.

A Headwaters Drainage Assessment (HDA) is anticipated to be required to support the planned realignment of the North Tributary. The HDA will be completed in the spring and summer of 2019 and will include an amphibian call survey, updated fish surveying, water measurements, and channel morphology measurements. The HDA will address the North Tributary, the Northern Field Drainage Channel, and the Ephemeral Farm Drainage Channels. The HDA will be presented as a separate report under separate cover.

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7.0 MONITORING

Construction stage monitoring requirements are outlined in Section 4.4.6 and 4.4.7 (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 Qualified 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 Endangered Species Act authorization and review process.

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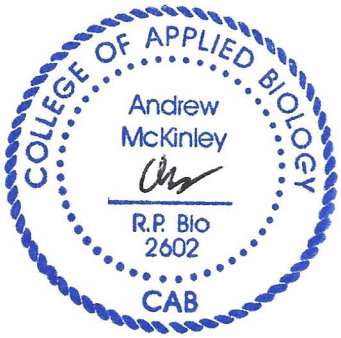
8.0 CLOSURE

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

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

Sincerely,



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

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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
Common Cattail	Typha latifolia	S5	Common	Aquatic
Lady Fern	Athyrium filix-femina	S5	Common	Fern
Spinulose Wood Fern	Dryopteris carthusiana	S5	Common	Fern
Ostrich Fern	Matteuccia struthiopteris	S5	Common	Fern
Sensitive Fern	Onoclea sensibilis	S5	Common	Fern
Royal Fern	Osmunda Regalis	S5	Common	Fern
Brome Grass	Bromus sp.		n/a	Grass
Orchard Grass	Dactylis glomerata	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
Doll's Eyes	Actaea pachypoda	S5	Common	Herbaceous
White Snakeroot	Ageratina altissima	S5	Common	Herbaceous
Common Ragweed	Ambrosia artemisiifolia	S5	Common	Herbaceous
Canada Anemone	Anemone canadensis	S5	Common	Herbaceous
Wood Anemone	Anemone quinquefolie	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
Common Milkweed	Asclepias syriaca	S5	Common	Herbaceous
Yellow Rocket	Barbarea vulgaris	SNA	Common	Herbaceous
Lamb's Quarters Pigweed	Chenopodium album	SNA	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
Daisy Fleabane	Erigeron annuus	S5	Common	Herbaceous
Philadelphia Fleabane	Erigeron philadelphicus	S5	Common	Herbaceous

Trout Lily	Erythronium americanum	S5	Common	Herbaceous
Narrow-leaved Goldenrod	Euthamia graminifolia	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
Yellow Avens	Geum aleppicum	S5	Common	Herbaceous
White Avens	Geum canadense	S5	Common	Herbaceous
Rough Sunflower	Helianthus divarticatus	S5	RS (2*): Constance Bay Sand Hills* (common); Morris Island CA.	Herbaceous
Orange Hawkweed	Hieracium aurantiacum	SNA	Common	Herbaceous
Yellow Hawkweed	Hieracium caespitosum	SNA	Uncommon	Herbaceous
Spotted Touch Me Not	Impatiens capensis	S5	Common	Herbaceous
Elecampane	Inula helenium	SNA	Common	Herbaceous
Prickly Lettuce	Lactuca scariola	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
False Solomon's Seal	Maianthemum racemosum	S5	Common	Herbaceous
Common Mallow	Malva neglecta	SNA	Common	Herbaceous
Pineappleweed	Matricaria discoidea	SNA	Common	Herbaceous
Black Medic	Medicago lupulina	SNA	Common	Herbaceous
Yellow Woodsorrel	Oxalis stricta	S5	Common	Herbaceous
Wild Parsnip	Pastinaca sativa	SNA	Common	Herbaceous
Clearweed	Pilea pumila	S5	Uncommon	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
Bladder Campion	Silene vulgaris	SNA	Common	Herbaceous
Bittersweet Nightshade	Solanum dulcamara	SNA	Common	Herbaceous
Canada Goldenrod	Solidago canadensis	S5	Common	Herbaceous
Sow Thistle	Sonchus arvensis	SNA	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
Tall Meadow-rue	Thalictrum dasycarpum	S4?	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
Red Trillium	Trillium erectum	S5	Common	Herbaceous
White Trillium	Trillium grandiflorum	S5	Common	Herbaceous
Common Stinging Nettle	Urtica dioica	SNA	Common	Herbaceous
Common Mullein	Verbascum thapsus	SNA	Common	Herbaceous
Blue Vervain	Verbena hasta	S5	Common	Herbaceous
Common Speedwell	Veronica officinalis	SNA	Common	Herbaceous
Tufted Vetch	Vicia Cracca	SNA	Common	Herbaceous
Common Blue Violet	Viola sororia	S5	Common	Herbaceous
Common Horsetail	Equisetum arvense	S5	Common	Horsetail
Horsetail sp.	Equisetum sp.		n/a	Horsetail
Red Baneberry	Actaea rubra	S5	Common	Shrub
Alternate Leaved Dogwood	Cornus alternifolia	S5	Common	Shrub
Grey Dogwood	Cornus racemosa	S5	Uncommon	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
Skunk Currant	Ribes glandulosum	S5	Common	Shrub
Common Blackberry	Rubus allegheniensis	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
Silver Maple	Acer saccharinum	S5	Common	Tree
Sugar Maple	Acer saccharum	S5	Common	Tree
White Birch	Betula papyrifera	S5	Common	Tree
White Ash	Fraxinus americana	S5	Common	Tree
Green Ash	Fraxinus pennsylvanica	S5	Common	Tree
Butternut	***Juglans cinerea***	***S3***	***Endangered***	***Tree***
Domestic Apple	Malus sylvestris	n/a	Common	Tree
White Spruce	Picea glauca	S5	Common	Tree
Eastern White Pine	Pinus strobus	S5	Common	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
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
Virgins' Bower	Clematis Virginiana	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**
Red-winged Blackbird	Agelaius phoeniceus
Mallard	Anas fulvigula
Cedar Waxwing	Bombycilla cedrorum
Ruffed Grouse	Bonasa umbellus
Canada Goose	Branta canadensis
Red-tailed Hawk	Buteo jamaicensis
Northern Cardinal	Cardinalis cardinalis
Turkey Vulture	Cathartes aura
Veery	Catharus fuscescens
Killdeer	Charadrius vociferus
Northern Harrier	Circus cyaneus
Black-billed Cuckoo	Coccyzus erythropthalmus
Northern Flicker	Colaptes auratus
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
Common Yellowthroat	Geothlypis trichas
Barn Swallow - Threatened	***Hirundo rustica***
Baltimore Oriole	Icterus galbula
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
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
White-breasted Nuthatch	Sitta carolinensis
American Goldfinch	Spinus tristis
Clay-colored Sparrow	Spizella pallida
Chipping Sparrow	Spizella passerina
Field Sparrow	Spizella pusilla
European Starling	Sturnus vulgaris
Tree Swallow	Tachycineta bicolor
Brown Thrasher	Toxostoma rufum
House Wren	Troglodytes aedon
American Robin	Turdus migratorius
Eastern Kingbird	Tyrannus tyrannus
Red-eyed Vireo	Vireo olivaceus
Mourning Dove	Zenaida macroura
White-throated Sparrow	Zonotrichia albicollis

TABLE C: OTHER WILDLIFE	
Common Name	**Scientific Name**
Coyote	Canis latrans
Beaver	Castor canadensis
Groundhog	Marmota monax
White Tailed Deer	Odocoileus virginianus
Muskrat	Ondatra zibethicus
Common Raccoon	Procyon lotor
Eastern Grey Squirrel	Sciurus carolinensis
Red Squirrel	Sciurus vulgaris
Eastern Chipmunk	Tamias striatus
American Toad	Anaxyrus americanus
Green Frog	Lithobates clamitans
Northern Leopard Frog	Lithobates pipiens
Snapping Turtle - Special Concern	***Chelydra serpentina***
Common Garter Snake	Thamnophis sirtalis

APPENDIX C

Butternut Health Assessment (Rose Fleguel 2018)

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dpage@valecraft.com

September 5, 2018

RE: 1020 March Rd., Kanata North
BHA Report Number: 18-010
Date(s) of Butternut health assessment: August 23, 24, 27, 29 and 30, 2018

Dear Danny,

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.

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 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.

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

Valecraft Homes Ltd.
Danny Page, MCIP, RPP
1455 Youville Dr., Suite 210
Orleans, ON
K1C 6Z7

Property description: 1020 March Rd., Kanata North
BHA Report Number: 18-010
Date(s) of Butternut health assessment: August 23, 24, 27, 29 and 30, 2018
Date BHA Report prepared: September 5, 2018

Map datum used: ☒ NAD83 ☐ WGS84

Total number of trees in this BHA Report: 132

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	E0427028 N5024714	2	3	N		
2	E0427024 N5024721	2	3	N		
3	E0427024 N5024726	1	3	N		
4	E0427023 N5024724	2	2	N		

[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:
5	E0426984 N5024702	2	2	N		
6	E0426981 N5024697	2	6	N		
7	E0426978 N5024695	2	3	N		
8	E0426921 N5024641	2	0	N		
9	E0426900 N5024621	1	6	N		
10	E0426897 N5024615	1	30	N		
11	E0426850 N5024581	1	30	N		
12	E0426849 N5024580	1	21	N		
13	E0426749 N5024481	2	3	N		
14	E0426750 N5024482	2	0	N		
15	E0426761 N5024483	1	19	N		
16	E0426757 N5024468	2	2	N		
17	E0426754 N5024462	2	0	N		
18	E0426762 N5024464	2	2	N		
19	E0426771 N5024488	2	0	N		
20	E0426770 N5024495	2	0	N		
21	E0426777 N5024504	2	36	N		
22	E0426812 N5024526	2	0	N		
23	E0426812 N5024529	2	0	N		
24	E0426827 N5024547	2	0	N		
25	E0426831 N5024558	1	36	N		
26	E0426835 N5024559	2	2	N		
27	E0426839 N5024569	1	26	N		
28	E0426848 N5024561	1	29	N		

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:
29	E0426865 N5024582	1	24	N		
30	E0426873 N5024574	1	33	N		
31	E0426874 N5024565	1	46	N		
32	E0426886 N5024582	1	17	N		
33	E0426881 N5024590	1	17	N		
34	E0426876 N5024593	3	39	N		
35	E0426886 N5024601	1	27	N		
36	E0426886 N5024598	3	31	N		
37	E0426887 N5024605	1	24	N		
38	E0426904 N5024615	3	24	N		
39	E0426906 N5024621	1	18	N		
40	E0426963 N5024660	2	13	N		
41	E0426964 N5024665	2	23	N		
42	E0427048 N5024731	2	0	N		
43	E0427051 N5024772	2	2	N		
44	E0427040 N5024777	2	0	N		
45	E0427032 N5024801	2	2	N		
46	E0427074 N5024691	1	11	N		
47	E0427054 N5024675	2	2	N		
48	E0427050 N5024678	1	6	N		
49	E0427027 N5024665	2	2	N		
50	E0427974 N5024657	2	0	N		
51	E0427011 N5024640	1	4	N		
52	E0427013 N5024640	2	0	N		

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:
53	E0427017 N5024649	2	0	N		
54	E0427017 N5024645	2	2	N		
55	E0427005 N5024662	2	2	N		
56	E0427027 N5024663	2	3	N		
57	E0427037 N5024654	2	0	N		
58	E0427063 N5024653	2	2	N		
59	E0427079 N5024659	1	5	N		
60	E0427092 N5024659	1	15	N		
61	E0427114 N5024642	1	3	N		
62	E0427088 N5024637	3	20	N		
63	E0427083 N5024644	2	18	N		
64	E0427061 N5024639	2	2	N		
65	E0427052 N5024649	2	2	N		
66	E0427048 N5024648	1	3	N		
67	E0427035 N5024626	2	3	N		
68	E0427029 N5024625	1	3	N		
69	E0427031 N5024607	2	1	N		
70	E0427031 N5024593	2	5	N		
71	E0427114 N5024604	2	12	N		
72	E0427108 N5024606	2	1	N		
73	E0427105 N5024603	1	7	N		
74	E0426738 N5024465	2	0	N		
75	E0426731 N5023664	2	0	N		
76	E0426609 N5024478	2	0	N		

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:
77	E0426739 N5024465	2	0	N		
78	E0426738 N5024465	2	8	N		
79	E0426760 N5024457	1	3	N		
80	E0426658 N5024451	1	2	N		
81	E0426794 N5024425	1	28	N		
82	E0426816 N5024407	1	18	N		
83	E0426841 N5024364	1	44	N		
84	E0426843 N5024320	3	71	N		
85	E0426852 N5024372	1	55	N		
86	E0426804 N5024450	2	0	N		
87	E0426782 N5024473	2	0	N		
88	E0426798 N5024486	2	0	N		
89	E0426913 N5024415	1	33	N		
90	E0426829 N5024529	1	13	N		
91	E0426893 N5024476	1	16	N		
92	E0426909 N5024481	1	29	N		
93	E0426916 N5024559	1	15	N		
94	E0426890 N5024551	1	15	N		
95	E0426921 N5024516	1	36	N		
96	E0426930 N5024518	1	26	N		
97	E0426938 N5024518	3	31	N		
98	E0426933 N5024526	1	29	N		
99	E0426295 N5024087	2	28	N		
100	E0426376 N5024147	2	6	N		

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:
101	E0426766 N5024412	2	0	N		
102	E0426734 N5024445	2	2	N		
103	E0426735 N5024445	2	2	N		
104	E0426701 N5024486	2	5	N		
105	E0426677 N5024500	1	11	N		
106	E0426677 N5024501	1	2	N		
107	E0426687 N5024489	2	8	N		
108	E0426687 N5024489	1	5	N		
109	E0426700 N5024480	2	7	N		
110	E0426739 N5024433	2	2	N		
111	E0426739 N5024425	2	3	N		
112	E0426744 N5024425	1	3	N		
113	E0426743 N5024425	1	5	N		
114	E0426745 N5024422	2	2	N		
115	E0426745 N5024432	2	2	N		
116	E0426752 N5024425	2	10	N		
117	E0426754 N5024410	2	1	N		
118	E0426755 N5024412	2	8	N		
119	E0426754 N5024408	1	4	N		
120	E0426797 N5024330	2	0	N		
121	E0426752 N5024325	2	0	N		
122	E0426523 N5024149	3	32	N		
123	E0426518 N5024172	2	0	N		
124	E0426495 N5024197	1	76	N		

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:
125	E0426467 N5024200	1	50	N		
126	E042480 N5024228	2	0	N		
127	E0426469 N5024232	2	2	N		
128	E0426490 N5024231	2	0	N		
129	E0426482 N5024258	1	37	N		
130	E0426473 N5024263	1	30	N		
131	E0426464 N5024283	1	40	N		
132	E0426474 N5024283	1	27	N		

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	54	• 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.

Result:	Total #:	Important information for persons planning activities that may affect Butternut:
		• 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	71	• 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	7	• A Category 3 tree is one that may be useful in determining sources of resistance to Butternut Canker, and is considered "archivable". • Category 3 trees are not eligible to be killed, harmed or taken under section 23.7 of Ontario Regulation 242/08. • 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 #	18-010	Assessment Date(s)	August 23, 24, 27, 29 and 30, 2018	Total # Butternut Trees in BHA Report	132
BHA ID #	2	BHA Name	Rosemary Fleguel		
Landowner / Client Name			Valecraft Homes Ltd.		
Property Location			1020 March Rd., Kanata		

input field data										automatic calculations from field data						Categories: 1: non-retainable, 2: retainable, 3: archivable				
			# bole cankers				# root flare (RF) cankers													
Tree #	Live Crown %	Tree dbh (cm)	sooty (S) (will be assigned 2.5 cm per canker)		open (O) (will be assigned 5 cm per canker)				<40 m from cankered tree? (Y or N)	Circ. (cm) = Pi x dbh	total bole canker width (sooty x 2.5 + open x 5)	total RF canker width (sooty x 2.5 + open x 5)	bole canker % of circ.	RF canker % of circ.	total bole & root canker % of 2xCirc	LC% >/= 50 & BC% = 0	LC% >70 & BRC % <20	LC% >70 & BC % <20	Preliminary tree call	FINAL TREE CALL a Cat 2, dbh>20cm <40m from a Cat 1
			S <2 m	S >2 m	O <2 m	O >2 m	RF S	RF O		Circ (cm)	BC (cm)	RC (cm)	BC%	RC%	BRC%					
1	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**
2	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**
3	100	3	1	1	0	0	0	0		9.42	5.0	0.0	**53.1**	**0.0**	**26.5**	1	1	1	**1**	**1**
4	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**
5	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**
6	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**
7	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**
8	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**
9	20	6	0							18.84	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
10	20	30								94.2	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
11	80	30	1	2	4	1	2	1		94.2	32.5	10.0	**34.5**	**10.6**	**22.6**	1	1	1	**1**	**1**
12	10	21								65.94	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
13	100	3	1	0	0	0	0	0		9.42	2.5	0.0	**26.5**	**0.0**	**13.3**	1	2	1	**2**	**2**
14	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**
15	95	19	4	3	4	0	1	2		59.66	37.5	12.5	**62.9**	**21.0**	**41.9**	1	1	1	**1**	**1**
16	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**
17	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**
18	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**
19	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**
20	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**
21	95	36	1	0	0	0	1	2		113	2.5	12.5	**2.2**	**11.1**	**6.6**	1	2	2	**2**	**2**
22	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**
23	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**
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	30	36								113	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
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	0	26								81.64	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
28	0	29								91.06	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
29	10	24								75.36	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
30	20	33								103.6	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
31	90	46	2	1	8	0	2	3	y	144.4	47.5	20.0	**32.9**	**13.8**	**23.4**	1	1	1	**1**	**1**

32	80	17	4	3	5	6	1	1		53.38	72.5	7.5	**135.8**	**14.1**	**74.9**	1	1	1	**1**	**1**
33	0	17								53.38	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
34	80	39	1	0	0	1	1	1	y	122.5	7.5	7.5	**6.1**	**6.1**	**6.1**	1	2	2	**2**	**3**
35	0	27								84.78	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
36	90	31	0	0	3	0	3	1	y	97.34	15.0	12.5	**15.4**	**12.8**	**14.1**	1	2	2	**2**	**3**
37	0	24								75.36	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
38	90	24	2	0	0	0	2	1	y	75.36	5.0	10.0	**6.6**	**13.3**	**10.0**	1	2	2	**2**	**3**
39	10	18								56.52	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
40	95	13	1	0	2	0	0	0		40.82	12.5	0.0	**30.6**	**0.0**	**15.3**	1	2	1	**2**	**2**
41	95	23	4	0	0	0	1	2	n	72.22	10.0	12.5	**13.8**	**17.3**	**15.6**	1	2	2	**2**	**2**
42	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**
43	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**
44	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**
45	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**
46	0	11								34.54	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
47	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**
48	0	6								18.84	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
49	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**
50	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**
51	100	4	3	0	4	0	2	0		12.56	27.5	5.0	**218.9**	**39.8**	**129.4**	1	1	1	**1**	**1**
52	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**
53	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**
54	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**
55	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**
56	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**
57	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**
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	0	5								15.7	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
60	0	15								47.1	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
61	0	3								9.42	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
62	100	20	1	0	0	0	2	1	y	62.8	2.5	10.0	**4.0**	**15.9**	**10.0**	1	2	2	**2**	**3**
63	100	18	2	0	1	0	0	1	y	56.52	10.0	5.0	**17.7**	**8.8**	**13.3**	1	2	2	**2**	**2**
64	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**
65	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**
66	0	3								9.42	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
67	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**
68	100	3	4	0	0	0	0	0		9.42	10.0	0.0	**106.2**	**0.0**	**53.1**	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	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**
71	100	12	0	0	0	0	0	0		37.68	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
72	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**
73	0	7								21.98	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
74	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**
75	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**
76	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**
77	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**
78	100	8	0	0	1	0	0	0		25.12	5.0	0.0	**19.9**	**0.0**	**10.0**	1	2	2	**2**	**2**
79	100	3	4	0	1	0	0	0		9.42	15.0	0.0	**159.2**	**0.0**	**79.6**	1	1	1	**1**	**1**
80	100	2	0	0	1	0	0	0		6.28	5.0	0.0	**79.6**	**0.0**	**39.8**	1	1	1	**1**	**1**

81	90	28	5	3	6	3	2	2	y	87.92	65.0	15.0	**73.9**	**17.1**	**45.5**	1	1	1	**1**	**1**
82	0	18								56.52	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
83	0	44								138.2	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
84	90	71	4	0	1	0	6	2	y	222.9	15.0	25.0	**6.7**	**11.2**	**9.0**	1	2	2	**2**	**3**
85	0	55								172.7	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
86	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**
87	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**
88	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**
89	30	33								103.6	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
90	0	13								40.82	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
91	0	16								50.24	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
92	10	15								47.1	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
93	95	15	4	2	2	1	3	1		47.1	30.0	12.5	**63.7**	**26.5**	**45.1**	1	1	1	**1**	**1**
94	40	28								87.92	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
95	0	36								113	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
96	0	26								81.64	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
97	95	31	6	0	0	1	0	0	y	97.34	20.0	0.0	**20.5**	**0.0**	**10.3**	1	2	1	**2**	**3**
98	0	29								91.06	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
99	95	28	2	0	0	0	3	0	n	87.92	5.0	7.5	**5.7**	**8.5**	**7.1**	1	2	2	**2**	**2**
100	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**
101	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**
102	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**
103	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**
104	100	8	1	0	3	0	0	1		25.12	17.5	5.0	**69.7**	**19.9**	**44.8**	1	1	1	**1**	**1**
105	100	2	0	0	3	0	1	1		6.28	15.0	7.5	**238.9**	**119.4**	**179.1**	1	1	1	**1**	**1**
106	100	2	1	0	0	0	0	1		6.28	2.5	5.0	**39.8**	**79.6**	**59.7**	1	1	1	**1**	**1**
107	100	8	1	0	0	0	0	1		25.12	2.5	5.0	**10.0**	**19.9**	**14.9**	1	2	2	**2**	**2**
108	100	5	0	0	2	0	0	0		15.7	10.0	0.0	**63.7**	**0.0**	**31.8**	1	1	1	**1**	**1**
109	100	7	0	0	0	0	2	0		21.98	0.0	5.0	**0.0**	**22.7**	**11.4**	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	3	0	0	0	0	0	0		9.42	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
112	100	3	4	0	0	0	0	0		9.42	10.0	0.0	**106.2**	**0.0**	**53.1**	1	1	1	**1**	**1**
113	100	5	1	0	1	0	0	0		15.7	7.5	0.0	**47.8**	**0.0**	**23.9**	1	1	1	**1**	**1**
114	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**
115	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**
116	100	10	1	0	1	0	0	0		31.4	7.5	0.0	**23.9**	**0.0**	**11.9**	1	2	1	**2**	**2**
117	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**
118	100	8	1	0	1	0	1	0		25.12	7.5	2.5	**29.9**	**10.0**	**19.9**	1	2	1	**2**	**2**
119	100	4	4	0	1	0	0	0		12.56	15.0	0.0	**119.4**	**0.0**	**59.7**	1	1	1	**1**	**1**
120	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**
121	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**
122	95	32	5	0	0	0	4	0	y	100.5	12.5	10.0	**12.4**	**10.0**	**11.2**	1	2	2	**2**	**3**
123	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**
124	70	76	4	0	0	0	1	1	y	238.6	10.0	7.5	**4.2**	**3.1**	**3.7**	1	1	1	**1**	**1**
125	0	50								157	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
126	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**
127	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**
128	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**
129	0	37								116.2	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**

130	0	30								94.2	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
131	80	40	11	3	0	1	0	4	y	125.6	40.0	20.0	**31.8**	**15.9**	**23.9**	1	1	1	**1**	**1**
132	0	27								84.78	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
133										0	0.0	0.0	**#####**	**#####**	**#####**	####	###	###	**##**	**#DIV/0!**
134										0	0.0	0.0	**#####**	**#####**	**#####**	####	###	###	**##**	**#DIV/0!**
135										0	0.0	0.0	**#####**	**#####**	**#####**	####	###	###	**##**	**#DIV/0!**
136										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) 23 - 08 - 2018

Shaded fields are mandatory for Butternut Health Assessments

Surveyor Contact

First ROSE Last FLEGUEL

Email

Telephone (613) 858-3678 Telephone Other ( ) - X

Property Owner (check if same as surveyor) ☐

First DANNY Last PAGE

or Company VALECRAFT HOMES LTD

Email DPAGE@VALECRAFT.COM

Telephone ( ) - Telephone Other (613) 837-1104 X 203

Property Owner's Mailing address

Address 145 YOUVILLE DR SUITE 210 Postal Code K1C 6Z7 Prov. ON

City ORLEANS

Tree Location *(if different from mailing address)*

Address/(911#) 1020 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

Large amounts of regen on site - good seed production + viability

Overall Property Description (area(s) containing Butternut)

☐ Rolling Upland ☐ Bottomland
☐ Valley Slope ☐ Variable
☐ Tableland ☐ Unknown

Vegetation Community/ies

☐ Open ☐ Fencerow
☐ Shrubland ☐ Roadside
☐ DeciduousForest ☐ Quary
☐ ConiferForest ☐ UrbanYard
☐ MixedForest ☐ UrbanPark

Other

Soil Drainage

☐ Well Drained
☐ Moderately Drained
☐ Poorly Drained
☐ Unknown

Soil Texture

☐ Clay ☐ Sand
☐ Clay Loam ☐ Variable
☐ Loam ☐ Unknown
☐ Loamy Sand

Soil Depth

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

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

Page Link 427028

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Forest Gene Conservation Association
Suite 233, 266 Charlotte St.
Peterborough, ON, K9J 2V4
www.fgca.net

49731

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) 23 - 08 - 2018

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

Tree # 1

Zone 18 | Easting 427028 | Northing 5024714

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

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 | # 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 # 2

Zone 18 | Easting 427024 | Northing 5024721

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

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 | # 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 # 3

Zone 18 | Easting 427024 | Northing 5024726

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 1

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

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

Competing Species

Tree # 4

Zone 18 | Easting 427023 | Northing 5024724

Crown Class | Live Crown % 106 | 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 0

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

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

Competing Species

Tree # 5

Zone 18 | Easting 426984 | Northing 5024702

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 0

	#Open	#Sooty
Root	0	0
=<2m	0	0
>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 427028

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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) 23 - 08 - 2018

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

Tree # 6 | Zone 18 | Easting 426981 | Northing 5024697

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) 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	1
=<2m	1	0
>2m	0	0

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

Competing Species

Deer rub on stem

Tree # 7 | Zone 18 | Easting 426978 | Northing 5024695

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) 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 0

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

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

Competing Species

Tree # 8 | Zone 18 | Easting 426921 | Northing 5024641

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

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 # 9 | Zone 18 | Easting 426900 | Northing 5024621

Crown Class | Live Crown % 20 | Main Stem Length(m) Below crown | Seed Signs

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 | #Epic-Dead | Bark Type | # Callused Wounds

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

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

Competing Species

Tree # 10 | Zone 18 | Easting 426897 | Northing 5024615

Crown Class | Live Crown % 20 | Main Stem Length(m) Below crown | Seed Signs

1

☐ 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

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Surveyor Last Name

Date (dd/mm/yyyy): 23 - 08 - 2018

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

Tree #: 11 | Zone: 18 | Easting: 426850 | Northing: 5024581

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

- [ ] 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
				7

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

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

Competing Species

Tree #: 12 | Zone: 18 | Easting: 426849 | Northing: 5024580

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

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

#Stems: 1 | DBH(cm): 21

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

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

Assess below live crown

	#Epic-Live	#Epic-Dead	Bark Type	# Callused Wounds
				1

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

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

Competing Species

Tree #: 13 | Zone: 18 | Easting: 426749 | Northing: 5024481

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

- [ ] 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
				1

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

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

Competing Species

Tree #: 14 | Zone: 18 | Easting: 426750 | Northing: 5024482

Crown Class | Live Crown %: 100 | 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	#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 #: 15 | Zone: 18 | Easting: 426761 | Northing: 5024483

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

- [ ] 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
				6

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

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

Competing Species

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Date (dd/mm/yyyy) 23 - 08 - 2018

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

Tree # 16 | Zone 18 | Easting 426757 | Northing 5024468

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

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 | # 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 # 17 | Zone 18 | Easting 426754 | Northing 5024462

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 # 18 | Zone 18 | Easting 426762 | Northing 5024464

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 # 19 | Zone 18 | Easting 426771 | Northing 5024488

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 # 20 | Zone 18 | Easting 426770 | Northing 5024495

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

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Date (dd/mm/yyyy) 23 - 08 - 2018

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

Tree # 21 | Zone 18 | Easting 426777 | Northing 5024504

Crown Class 2 | Live Crown % 95 | Main Stem Length(m) Below crown 2 | Seed Signs: None

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

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

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

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

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

Competing Species

Tree # 22 | Zone 18 | Easting 426812 | Northing 5024526

Crown Class 2 | Live Crown % 100 | Main Stem Length(m) Below crown 1 | Seed Signs: None

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

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

☐ 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

2 replacement stems - original sapling died back

Tree # 23 | Zone 18 | Easting 426812 | Northing 5024529

Crown Class 2 | Live Crown % 90 | Main Stem Length(m) Below crown 1 | Seed Signs: None

☐ 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 | #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 # 24 | Zone 18 | Easting 426827 | Northing 5024547

Crown Class 2 | Live Crown % 100 | Main Stem Length(m) Below crown 1 | Seed Signs: None

☐ 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 | #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 # 25 | Zone 18 | Easting 426831 | Northing 5024558

Crown Class 1 | Live Crown % 30 | Main Stem Length(m) Below crown | Seed Signs: None

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

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

Tree # 26 | Zone 18 | Easting 426835 | Northing 5024559

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 6

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

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

Competing Species

Tree # 27 | Zone 18 | Easting 426839 | Northing 5024569

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

Tree # 28 | Zone 18 | Easting 426848 | Northing 5024561

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration

#Stems 2 | DBH(cm) 29

Butternut Origin: Natural | Planted | Unknown

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

Assess below live crown: #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 # 29 | Zone 18 | Easting 426865 | Northing 5024582

Crown Class | Live Crown % 10 | 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 # 30 | Zone 18 | Easting 426873 | Northing 5014574

Crown Class | Live Crown % 20 | Main Stem Length(m) Below crown

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

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Date (dd/mm/yyyy) 23 - 08 - 2018

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

Tree # 31

Zone 18 | Easting 426874 | Northing 5024565

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 2 | DBH(cm) 46

Butternut Origin: Natural | Planted | Unknown

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

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

	#Open	#Sooty
Root	3	2
=<2m	8	2
>2m	0	1

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

Competing Species

Tree # 32

Zone 18 | Easting 426886 | Northing 5024582

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

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 | #Epic-Dead | Bark Type | # Callused Wounds 11

	#Open	#Sooty
Root	1	1
=<2m	5	4
>2m	6	3

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

Competing Species

Tree # 33

Zone 18 | Easting 426881 | Northing 5024590

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 2 | DBH(cm) 17

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 # 34

Zone 18 | Easting 426876 | Northing 5024593

Crown Class | Live Crown % 80 | Main Stem Length(m) Below crown 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 6

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

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

Competing Species

Tree # 35

Zone 18 | Easting 426886 | Northing 5024601

Crown Class | Live Crown % 0 | 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

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Surveyor Last Name

Date (dd/mm/yyyy) 23 - 08 - 2018

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

Tree # 36 | Zone 18 | Easting 426886 | Northing 5024598

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

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 5

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

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

Competing Species

Tree # 37 | Zone 18 | Easting 426887 | Northing 5024605

Crown Class 1 | Live Crown % 90 | 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 # 38 | Zone 18 | Easting 426904 | Northing 5024615

Crown Class 3 | Live Crown % 90 | Main Stem Length(m) Below crown 2

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 4

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

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

Competing Species

Tree # 39 | Zone 18 | Easting 426906 | Northing 5024621

Crown Class 1 | Live Crown % 10 | Main Stem Length(m) Below crown

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

Tree # 40 | Zone 18 | Easting 426963 | Northing 5024660

Crown Class 2 | 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 | #Epic-Dead | Bark Type | # Callused Wounds 2

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

Surveyor Last Name

Date (dd/mm/yyyy) 23 - 08 - 2018

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

Tree # 41 | Zone 18 | Easting 426964 | Northing 5024665

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

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	1
=<2m	0	4
>2m	0	0

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

Competing Species

Tree # 42 | Zone 18 | Easting 427048 | Northing 5024731

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

2

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems 4 | 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

4 stems replacing sapling die-back

Tree # 43 | Zone 18 | Easting 427051 | Northing 5024772

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 # 44 | Zone 18 | Easting 427040 | Northing 5024777

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 # 45 | Zone 18 | Easting 427032 | Northing 5024801

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 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): 24 - 08 - 2018

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

Tree #: 46 | Zone: 18 | Easting: 427054 | Northing: 5024691

Crown Class: 1 | Live Crown %: 0 | Main Stem Length(m) Below crown: | Seed Signs: | Butternut Origin:

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

#Stems: 1 | DBH(cm): 11

- [ ] Male Flowers
- [ ] Female Flowers
- [ ] Seed Set
- [ ] None
- [ ] Natural
- [ ] Planted
- [ ] Unknown

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

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

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

Competing Species

Tree #: 47 | Zone: 18 | Easting: 427054 | Northing: 5024675

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

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

#Stems: 1 | DBH(cm): 2

- [ ] Male Flowers
- [ ] Female Flowers
- [ ] Seed Set
- [ ] None
- [ ] Natural
- [ ] Planted
- [ ] Unknown

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

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

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

Competing Species

New stem from sapling dieback

Tree #: 48 | Zone: 18 | Easting: 427050 | Northing: 5024678

Crown Class: 1 | Live Crown %: 0 | Main Stem Length(m) Below crown: | Seed Signs: | Butternut Origin:

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

#Stems: 1 | DBH(cm): 6

- [ ] Male Flowers
- [ ] Female Flowers
- [ ] Seed Set
- [ ] None
- [ ] Natural
- [ ] Planted
- [ ] Unknown

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

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

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

Competing Species

Tree #: 49 | Zone: 18 | Easting: 427027 | Northing: 5014665

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

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

#Stems: 1 | DBH(cm): 2

- [ ] Male Flowers
- [ ] Female Flowers
- [ ] Seed Set
- [ ] None
- [ ] Natural
- [ ] Planted
- [ ] Unknown

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 #: 50 | Zone: 18 | Easting: 427974 | Northing: 5024657

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

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

#Stems: 1 | DBH(cm): 1

- [ ] Male Flowers
- [ ] Female Flowers
- [ ] Seed Set
- [ ] None
- [ ] Natural
- [ ] Planted
- [ ] Unknown

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) 24 - 08 - 2018

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

Tree # 51 | Zone 18 | Easting 427011 | Northing 5024640

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 | 2 # Callused Wounds

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

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

Competing Species

Tree # 52 | Zone 18 | Easting 427013 | Northing 5024640

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 | 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 # 53 | Zone 18 | Easting 427017 | Northing 5024649

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 | 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 # 54 | Zone 18 | Easting 427017 | Northing 5024645

Crown Class | Live Crown % 100 | Main Stem Length(m) Below crown 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 | 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 # 55 | Zone 18 | Easting 427005 | Northing 5024662

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

Surveyor Last Name | Date (dd/mm/yyyy): 24 - 08 - 2018

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

Tree #: 56 | Zone: 18 | Easting: 427027 | Northing: 5024663

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): 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: 0

	#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: 427037 | Northing: 5024654

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

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:

Replacement shoot for dead sapling

Tree #: 58 | Zone: 18 | Easting: 427063 | Northing: 5024653

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): 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 #: 59 | Zone: 18 | Easting: 427077 | Northing: 5024659

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

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 | #Epic-Dead | Bark Type | # Callused Wounds:

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

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

Competing Species:

Tree #: 60 | Zone: 18 | Easting: 427092 | Northing: 5024659

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

1

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

#Stems: 1 | 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:

	#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) 24 - 08 - 2018

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

Tree # 61 | Zone 18 | Easting 427114 | Northing 5024642

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

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

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

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

Competing Species

Tree # 62 | Zone 18 | Easting 427088 | Northing 5024637

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

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

Butternut Origin: Natural | Planted | Unknown

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

Assess below live crown: #Epic-Live | #Epic-Dead | Bark Type | 13 # Callused Wounds

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

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

Competing Species

Archivable

Tree # 63 | Zone 18 | Easting 427083 | Northing 5024644

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 2 | 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 | 22 # Callused Wounds

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

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

Competing Species

2nd stem small + dead - Archivable - recovery

Tree # 64 | Zone 18 | Easting 427061 | Northing 5024639

Crown Class | Live Crown % 100 | Main Stem Length(m) Below crown 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 | 0 # Callused Wounds

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

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

Competing Species

2 new stems off dead sapling

Tree # 65 | Zone 18 | Easting 427052 | Northing 5024649

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 | 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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Shaded fields are mandatory for Butternut Health Assessments

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

Surveyor Last Name

Date (dd/mm/yyyy): 24 - 08 - 2018

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

Tree #: 66 | Zone: 18 | Easting: 427048 | Northing: 5024648

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

☐ 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

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

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

Competing Species

Tree #: 67 | Zone: 18 | Easting: 427035 | Northing: 5024626

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

☐ 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 | #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

Bent by fallen EW.

Tree #: 68 | Zone: 18 | Easting: 427029 | Northing: 5024625

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

☐ 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 | #Epic-Dead | Bark Type | # Callused Wounds: 3

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

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

Competing Species

Tree #: 69 | Zone: 18 | Easting: 427031 | Northing: 5024607

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

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | #Stems: 2 | 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

2 new stems off dead sapling

Tree #: 70 | Zone: 18 | Easting: 427024 | Northing: 5024593

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

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

Surveyor Last Name | Date (dd/mm/yyyy): 24 - 08 - 2018

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

Tree #: 71 | Zone: 18 | Easting: 427114 | Northing: 5024604

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): 12

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

Assess below live crown

	#Open	#Sooty
#Epic-Live		
#Epic-Dead		
Bark Type		
# Callused Wounds: 1		
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: 427108 | Northing: 5024606

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): 1

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

Assess below live crown

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

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

Competing Species

2 new stems of dead sapling

Tree #: 73 | Zone: 18 | Easting: 427105 | Northing: 5024603

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

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

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

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

Competing Species

Tree #: 74 | Zone: 18 | Easting: 426738 | Northing: 5024465

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

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

	#Open	#Sooty
#Epic-Live		
#Epic-Dead		
Bark Type		
# Callused Wounds: 0		
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: 426731 | Northing: 5024478

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

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

	#Open	#Sooty
#Epic-Live		
#Epic-Dead		
Bark Type		
# Callused Wounds: 0		
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) 27-08-2018

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

Tree # 76 | Zone 18 | Easting 426746 | Northing 5024462

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 # 77 | Zone 18 | Easting 426739 | Northing 5024465

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 # 78 | Zone 18 | Easting 426738 | Northing 5024465

Crown Class 2 | Live Crown % 100 | Main Stem Length(m) Below crown 4

☐ 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 2

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

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

Competing Species

Tree # 79 | Zone 18 | Easting 426760 | Northing 5024457

Crown Class 1 | 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 | # Callused Wounds 1

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

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

Competing Species

Tree # 80 | Zone 18 | Easting 426758 | Northing 5024451

Crown Class 1 | 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	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) 27 - 08 - 2018

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

Tree # 81 | Zone 18 | Easting 426794 | Northing 5024425

Crown Class | Live Crown % 90 | Main Stem Length(m) Below crown 9

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 5 | # Callused Wounds 24

	#Open	#Sooty
Root	2	2
=<2m	6	5
>2m	3	3

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

Competing Species

Tree # 82 | Zone 18 | Easting 426816 | Northing 5024407

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

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

Tree # 83 | Zone 18 | Easting 426841 | Northing 5024364

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 # 84 | Zone 18 | Easting 426843 | Northing 5024320

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

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 5

	#Open	#Sooty
Root	2	6
=<2m	1	4
>2m	0	0

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

Competing Species

Mink BHA Tree # 228

Tree # 85 | Zone 18 | Easting 426852 | Northing 5024372

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 2 | 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

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

Surveyor Last Name

Date (dd/mm/yyyy) 27 - 08 - 2018

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

Tree # 86

Zone 18 | Easting 426804 | Northing 5024450

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 # 87

Zone 18 | Easting 426782 | Northing 5024473

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

New stem on sapling dieback

Tree # 88

Zone 18 | Easting 426798 | Northing 5024486

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 # 89

Zone 18 | Easting 426913 | Northing 5024415

Crown Class | Live Crown % 30 | Main Stem Length(m) Below crown

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 # 90

Zone 18 | Easting 426829 | Northing 5024529

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

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

	#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) 27-08-2018

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

Tree # 91 | Zone 18 | Easting 426893 | Northing 5024976

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

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

Tree # 92 | Zone 18 | Easting 426909 | Northing 5024481

Crown Class | Live Crown % 10 | 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

Tree # 93 | Zone 18 | Easting 426916 | Northing 5024559

Crown Class | Live Crown % 95 | Main Stem Length(m) Below crown 9 | Seed Signs

Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems 1 | 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 | 6 # Callused Wounds

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

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

Competing Species

Leaning - hit by Po

Tree # 94 | Zone 18 | Easting 426890 | Northing 5024551

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

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 # 95 | Zone 18 | Easting 426921 | Northing 5024516

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

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

Butternut Origin: Natural | Planted | Unknown

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

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

	#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) 27 - 08 - 2018

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

Tree # 96 | Zone 18 | Easting 426930 | Northing 5024518

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

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

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

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

Competing Species

Tree # 97 | Zone 18 | Easting 426938 | Northing 5024518

Crown Class | Live Crown % 95 | Main Stem Length(m) Below crown 9 | Seed Signs

3 | 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 17

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

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

Competing Species

Archivable

Tree # 98 | Zone 18 | Easting 426933 | Northing 5024526

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

1 | 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

Tree # 99 | Zone 18 | Easting 426295 | Northing 5024087

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) 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 1

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

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

Competing Species

Tree # 100 | Zone 18 | Easting 426376 | Northing 5024147

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) 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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Surveyor Last Name

Date (dd/mm/yyyy) 30 - 08 - 2018

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

Tree # 101 | Zone 18 | Easting 426766 | Northing 5024412

Crown Class | Live Crown % 100 | 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 | #Epic-Dead | Bark Type | # Callused Wounds 0

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

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

Competing Species

New stem on sapling that died back

Tree # 102 | Zone 18 | Easting 426734 | Northing 5024445

Crown Class | Live Crown % 100 | Main Stem Length(m) Below crown 2 | 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 | #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 # 103 | Zone 18 | Easting 426735 | Northing 5024448

Crown Class | Live Crown % 100 | Main Stem Length(m) Below crown 2 | 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 | #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 # 104 | Zone 18 | Easting 426701 | Northing 5024486

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

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 4

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

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

Competing Species

Tree # 105 | Zone 18 | Easting 426677 | Northing 5024500

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

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 | #Epic-Dead | Bark Type | # Callused Wounds 3

	#Open	#Sooty
Root	1	1
=<2m	3	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 - 08 - 2018

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

Tree # 106 | Zone 18 | Easting 426677 | Northing 5024501

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	1
>2m	0	0

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

Competing Species

Tree # 107 | Zone 18 | Easting 426687 | Northing 5024489

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 3

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

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

Competing Species

Tree # 108 | Zone 18 | Easting 426687 | Northing 5024489

Crown Class | Live Crown % 100 | Main Stem Length(m) Below crown 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 4

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

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

Competing Species

Tree # 109 | Zone 18 | Easting 426700 | Northing 5024480

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

Twig Dieback | Branch Dieback | Defoliation | Discolouration

#Stems 2 | 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	2	0
=<2m	0	0
>2m	0	0

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

Competing Species

Deer rub on stem

Tree # 110 | Zone 18 | Easting 426739 | Northing 5024433

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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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 - 08 - 2018

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

Tree #: 111 | **Zone**: 18 | **Easting**: 426739 | **Northing**: 5024425

Crown Class | Live Crown %: 100 | Main Stem Length(m) Below crown: 2 | **Seed Signs**: Male Flowers, Female Flowers, Seed Set, None

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

Butternut Origin: Natural, Planted, Unknown

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 #: 112 | **Zone**: 18 | **Easting**: 426744 | **Northing**: 5024425

Crown Class | Live Crown %: 100 | Main Stem Length(m) Below crown: 2 | **Seed Signs**: Male Flowers, Female Flowers, Seed Set, None

1 | Twig Dieback, Branch Dieback, Defoliation, Discolouration | #Stems: 5 | DBH(cm): 3

Butternut Origin: Natural, Planted, Unknown

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

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

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

Competing Species

Tree #: 113 | **Zone**: 18 | **Easting**: 426743 | **Northing**: 5024425

Crown Class | Live Crown %: 100 | Main Stem Length(m) Below crown: 2 | **Seed Signs**: Male Flowers, Female Flowers, Seed Set, None

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

Butternut Origin: Natural, Planted, Unknown

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

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

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

Competing Species

Tree #: 114 | **Zone**: 18 | **Easting**: 426745 | **Northing**: 5024422

Crown Class | Live Crown %: 100 | Main Stem Length(m) Below crown: 2 | **Seed Signs**: Male Flowers, Female Flowers, Seed Set, None

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

Butternut Origin: Natural, Planted, Unknown

Assess below live crown: #Epic-Live, #Epic-Dead, Bark Type, # 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 #: 115 | **Zone**: 18 | **Easting**: 426745 | **Northing**: 5024432

Crown Class | Live Crown %: 100 | Main Stem Length(m) Below crown: 2 | **Seed Signs**: Male Flowers, Female Flowers, Seed Set, None

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

Butternut Origin: Natural, Planted, Unknown

Assess below live crown: #Epic-Live, #Epic-Dead, Bark Type, # 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 - 08 - 2018

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

Tree # 116 | Zone 18 | Easting 426752 | Northing 5024425

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

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

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	1	1
>2m	0	0

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

Competing Species

Tree # 117 | Zone 18 | Easting 426754 | Northing 5024410

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

2 | ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration | 2 #Stems | 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; 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

2 new stems from bent over sapling.

Tree # 118 | Zone 18 | Easting 426755 | Northing 5024412

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: ☐☐ #Epic-Live; ☐☐ #Epic-Dead; ☐ Bark Type; 2 # Callused Wounds

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

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

Competing Species

Deer rub on stem

Tree # 119 | Zone 18 | Easting 426754 | Northing 5024408

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

1 | ☐ 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: ☐☐ #Epic-Live; ☐☐ #Epic-Dead; ☐ Bark Type; 2 # Callused Wounds

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

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

Competing Species

Tree # 120 | Zone 18 | Easting 426797 | Northing 5024330

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

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: ☐☐ #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

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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 - 05 - 2018

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

Tree #: 121 | Zone: 18 | Easting: 426752 | Northing: 5024325

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

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 #: 122 | Zone: 18 | Easting: 426523 | Northing: 5024149

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

3 | 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: 4

	#Open	#Sooty
Root	0	4
=<2m	0	5
>2m	0	0

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

Competing Species

Achvable

Tree #: 123 | Zone: 18 | Easting: 426518 | Northing: 5024172

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

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 #: 124 | Zone: 18 | Easting: 426495 | Northing: 5024197

Crown Class | Live Crown %: 70 | Main Stem Length(m) Below crown: 3 | Seed Signs

1 | Twig Dieback | Branch Dieback | Defoliation | Discolouration | #Stems: 1 | DBH(cm): 76

Butternut Origin: Natural | Planted | Unknown

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

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

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

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

Competing Species

Tree #: 125 | Zone: 18 | Easting: 426467 | Northing: 5024200

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

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

Butternut Origin: Natural | Planted | Unknown

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

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

	#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 - 08 - 2018

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

Tree # 126

Zone 18 | Easting 426480 | Northing 5024228

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 # 127

Zone 18 | Easting 426469 | Northing 5024232

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 # 128

Zone 18 | Easting 426490 | Northing 5024231

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 # 129

Zone 18 | Easting 426482 | Northing 5024258

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

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 | # Callused Wounds

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

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

Competing Species

Tree # 130

Zone 18 | Easting 426473 | Northing 5024263

Crown Class | Live Crown % 0 | 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

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

Surveyor ID or BHA #: 002

Date (dd/mm/yyyy): 30-08-2018

Surveyor Last Name:

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

Tree #	Zone	Easting	Northing
131	18	426464	5024283

Crown Class: | Live Crown %: 80 | Main Stem Length(m) Below crown: 3

☐ 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: 6

	#Open	#Sooty
Root	4	0
=<2m	0	11
>2m	1	3

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

Competing Species:

Tree #	Zone	Easting	Northing
132	18	426474	5024283

Crown Class: | Live Crown %: 0 | 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 #	Zone	Easting	Northing
	1		

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

☐ Twig Dieback
☐ Branch Dieback
☐ Defoliation
☐ Discolouration

#Stems: | DBH(cm):

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

Assess below live crown

#Epic-Live: | #Epic-Dead: | Bark Type: | # Callused Wounds:

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

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

Competing Species:

Tree #	Zone	Easting	Northing
	1		

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

☐ Twig Dieback
☐ Branch Dieback
☐ Defoliation
☐ Discolouration

#Stems: | DBH(cm):

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

Assess below live crown

#Epic-Live: | #Epic-Dead: | Bark Type: | # Callused Wounds:

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

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

Competing Species:

Tree #	Zone	Easting	Northing
	1		

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

☐ Twig Dieback
☐ Branch Dieback
☐ Defoliation
☐ Discolouration

#Stems: | DBH(cm):

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

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

Assess below live crown

#Epic-Live: | #Epic-Dead: | Bark Type: | # Callused Wounds:

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

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

Competing Species:

Please enter matching page link code on forms 1 and 2

Page Link: 427028

(Contact Information follows all applicable privacy policies and guidelines)

Please return forms to:
Forest Gene Conservation Association
Suite 233, 266 Charlotte St.
Peterborough, ON, K9J 2V4
www.fgca.net

49731

APPENDIX D

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 Campus Drive
Postal Box 2002
Kemptville ON K0G 1J0
Tel.: 613 258-8204
Fax: 613 258-3920

Ministère des Richesses naturelles et des Forêts

District de Kemptville

10, promenade Campus
Case postale, 2002
Kemptville ON K0G 1J0
Tél.: 613 258-8204
Téléc.: 613 258-3920

Ontario

Thu. Mar 1, 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: Valecraft Kanata North Development (1020 and 1070 March Rd)
Site Address: 1020 & 1070 March Road, Ottawa, ON, K2K 1X7
Our File No. 2018_MAR-4455

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:

- Lake (Non-Sensitive)
- Unevaluated Wetland (Not evaluated per OWES)

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 following Fish species were identified: American eel, blacknose shiner, bluntnose minnow, brook stickleback, central mudminnow, creek chub, Etheostoma sp., fathead minnow, finescale dace, largemouth bass, logperch, mottled sculpin, northern pike, northern redbelly dace, Notropis sp., pearl dace, pumpkinseed, Rhinichthys sp., rock bass, smallmouth bass, Sticklebacks, 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.

Water

The Ministry of Natural Resources and Forestry (MNRF) has established timing window guidelines to restrict in-water work related to an activity during certain periods. These restricted periods are identified in order to protect fish from impacts of works or undertakings in and around water during spawning and other critical life stages. A suite of appropriate measures should be taken for projects involving in-water works to minimize and mitigate impacts to fish, water quality and fish habitat, and include:

- avoiding in-water works during the timing guidelines;
- installation of sediment/erosion control measures;
- avoiding the removal, alteration, or covering of substrates used for fish spawning, feeding, over-wintering or nursery areas; and
- debris control measures to manage falling debris (e.g. spalling).

Timing guidelines are based on species* presence and are therefore subject to change if new information becomes available. Timing guidelines in Kemptville District are:

Waterbody (and applicable geography or Fisheries Management Zone)	Timing Guidelines (no in-water works)
○ St. Lawrence River (FMZ 20)	March 15 – July 15 (Spring spawning species)
○ Ottawa River – Lac Des Chats (FMZ 12)	October 1 to July 15 (Spring and fall spawning species, including Lake Trout and Lake Whitefish)
○ Ottawa River – Lac Deschenes (FMZ 12)	October 15 to July 15 (Spring and fall spawning species, including Cisco)
○ Ottawa River – Lac Dollard des Ormeaux (FMZ 12)	January 1 to July 15 (Winter and spring spawning species, including Burbot)
○ Big Rideau Lake (South Burgess, North Burgess, Bastard and South Elmsley Twps) ○ Charleston Lake (Lansdowne and Escott Twps) ○ Crow Lake (South Crosby Twp)	October 1 to June 30 (Spring and fall spawning species, including Lake Trout)
○ Bass Lake (South Elmsley Twp) ○ Lower Rideau Lake (South Elmsley Twp) ○ Bob's Lake (South Sherbrooke Twp) ○ Christie Lake (South Sherbrooke Twp) ○ Dalhousie Lake (Dalhousie Twp) ○ Davern Lake (South Sherbrooke Twp) ○ Farren Lake (South Sherbrooke Twp) ○ Grippen Lake (Leeds Twp) ○ Indian Lake (South Crosby Twp)	October 15 to June 30 (Spring and Fall spawning species, including Lake Whitefish and Cisco)

○ Little Long Lake (Lansdowne Twp) ○ Millpond Lake (South Burgess) ○ Otter Lake (South Elmsley, South Burgess and Bastard Twps) ○ Otty Lake (North Burgess and North Elmsley Twps) ○ Pike Lake (North Burgess Twp) ○ Silver Lake (South Sherbrooke Twp) ○ Redhorse Lake (Lansdowne Twp) ○ Tay River (South Sherbrooke, Bathurst, Drummond and North Elmsley Twps) ○ Wolfe Lake (North Crosby Twp)	
○ Bennett Lake (Bathurst Twp) ○ Crosby Lake (North Crosby Twp) ○ Gananoque River (Leeds Twp) ○ Lac Georges (Plantagenet and Alfred Twps) ○ Gillies Lake (Lanark Twp) ○ Little Crosby Lake (North Crosby Twp) ○ McLaren Lake (North Burgess Twp) ○ Mississippi Lake (Drummond, Beckwith and Ramsay Twps) ○ Mississippi River (Beckwith, Ramsay, Pakenham and Fitzroy Twps) ○ Raisin River below Martintown dam (Charlottenburgh Twp) ○ Rideau River (Wolford, Oxford, Montague, Marlborough, South Gower, North Gower, Osgood, Nepean and Gloucester Twps) ○ South Lake (Leeds Twp) ○ South Nation River below Plantagenet weir (Plantagenet Twp) ○ Upper Rideau Lake (North Crosby Twp) ○ Westport Sand Lake (North Crosby Twp)	January 1 – June 30 (Winter and spring spawning species, including Burbot)
○ Small rivers and streams (denoted on 1:50,000 National Topographic System maps as being one lined) ○ All other waterbodies in FMZ 18	March 15 to June 30 (Spring spawning species)

**Please note: Additional timing restrictions may apply as they relate to endangered and threatened species for works in both water and wetland areas. Timing restrictions are subject to change, depending on species found in a given waterbody.*

In addition to adhering to the above timing guidelines, a work permit from the MNRF may be required depending on the nature and scope of work. No encroachment on the bed or banks of a waterbody/watercourse (e.g. abutments, embankments, etc.) is permitted without MNRF approval. Additional information regarding work permits may be found online at https://www.ontario.ca/page/crown-land-work-permits#section-2.

The MNRF does not have any water quality or quantity data available. We recommend that the Ministry of the Environment and Climate Change be contacted for such data along with the local Conservation Authority. For further information regarding fish habitat and protocols, please refer to the following interagency, document, *Fish Habitat Referral Protocol for* Ontario at: http://www.web2.mnr.gov.on.ca/mnr/ebr/fish_hab_referral/protocol_en.pdf.

Additional approvals and permits may be required under the Fisheries Act and the Species at Risk Act; please contact Fisheries and Oceans Canada to determine requirements and next steps. There may also be approvals required by the local Conservation Authority or Transport Canada, and these agencies should be contacted directly to determine requirements. As the MNRF is

responsible for the management of provincial fish populations, we request ongoing involvement in such discussions in order to ensure population conservation.

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:

- American Eel (END)
- Sensitive Species (END)
- Barn Swallow (THR)
- Blanding's Turtle (THR)
- Bobolink (THR)
- Butternut (END)
- Chimney Swift (THR)
- Eastern Meadowlark (THR)
- Lake Sturgeon (THR)
- Least Bittern (THR)
- Little Brown Bat (END)
- Northern Long-eared Bat (END)
- Whip poor will (THR)
- Eastern Small-footed Myotis (END)
- Tri-Colored 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:

- Bald Eagle (SC)
- Black Tern (SC)
- Eastern Wood-Pewee (SC)
- Snapping Turtle (SC)
- Wood Thrush (SC)
- Monarch (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: Fri. Mar 1, 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