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Combined Environmental Impact Statement & Tree Conservation Report (Revised)
Kennedy Lands
3432 Greenbank Road, Ottawa, ON

April 2022
Prepared for Minto Communities

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EXECUTIVE SUMMARY

McKinley Environmental Solutions (MES) was retained by Minto Communities to prepare a Combined Environmental Impact Statement and Tree Conservation Report to support the development of the property known as the Kennedy Lands (the Site). The Site is located at 3432 Greenbank Road, Ottawa, Ontario (Part of Lot 12, Concession 3, Nepean). The Site is approximately 23 hectares in size and is proposed to be developed as a residential subdivision. At the current time, the Site is mostly vacant and includes a mixture of Cultivated Fields, Cultural Meadows (Graminoid Dominated), and Deciduous Hedgerows. The Site also includes three (3) minor drainage features, which are identified as minor tributaries of the Clarke Drain. The three (3) minor drainage features are aligned in an approximately south-north direction. Six (6) existing agricultural structures are found within the Site. The area north of the Site consists of agricultural lands on an adjacent property, beyond which is the Jock River. The alignment of the Jock River is such that the river occurs within close proximity to both the northwest corner of the Site and the eastern part of the Site. The area south of the Site includes a recently constructed residential subdivision. The area southwest and west of the Site includes a residential subdivision that is currently under construction.

The Site is proposed to be developed to accommodate a mix of single detached homes, executive townhomes, and avenue townhomes. A 0.73 ha Parkland Block is shown in the northern part of the Site. The Concept Plan also includes a 0.69 ha Stormwater Management Block. The Stormwater Management Block will accommodate a portion of a new Stormwater Management (SWM) Pond, with the remainder of the SWM Pond located within the adjacent residential subdivision. The new SWM Pond will provide SWM services for the Site. The Site will receive municipal sewer and water. As shown in the Concept Plan, the City of Ottawa plans to realign Greenbank Road through the Site.

Two (2) Natural Feature Blocks are shown in the Concept Plan. In order to address the presence of the 1:100 year floodplain of the Jock River, the Natural Feature Blocks have been positioned adjacent to the Jock River in the eastern and northwestern parts of the Site. Although the two (2) Natural Feature Blocks contain portions of the 1:100 year floodplain of the Jock River, portions of the floodplain also overlap the proposed development area. As such, a cut and fill operation will be required in order to address areas where the proposed development and the floodplain overlap. Following the completion of the cut and fill works, the two (2) Natural Feature Blocks will be ecologically restored by planting locally appropriate native trees and shrubs in any areas that currently lack vegetation. The two (2) Natural Feature Blocks also provide minimum 30 m wide setbacks from the Jock River. Existing trees and vegetation will be retained within the two (2) Natural Feature Blocks. Trees throughout the remainder of the Site will be removed in order to accommodate the planned development.

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The three (3) minor drainage features are identified as minor tributaries of the Clarke Drain. Drainage Feature A and Drainage Feature B will be decommissioned during the development of the Site. The remnant portion of Drainage Feature C will be retained within the Natural Feature Block in the northwest corner of the Site.

The six (6) existing agricultural structures that are found within the Site will be demolished by Minto Communities prior to the registration of the proposed subdivision. The demolition of the existing agricultural structures is necessary in order to accommodate the planned realignment of Greenbank Road through the Site. Due to the presence of nesting Barn Swallows (threatened) within the existing agricultural structures, the building demolition will require authorization under the Ontario Endangered Species Act. The Ministry of Environment, Conservation, and Parks (MECP) Online Impact Registration Process for Barn Swallows will be completed by Minto Communities prior to the commencement of building demolition. Minto Communities plans to complete the MECP Online Impact Registration Process and the building demolition in late 2022 (pending obtainment of the necessary authorizations). Mitigation and habitat compensation requirements for Barn Swallows are described below. No other significant Species at Risk concerns have been identified.

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.

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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, 4.1, and 4.2.2. 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 the Combined EIS and TCR is to assess whether the proposed project will negatively affect the significant features and functions of the Site, and to ensure that impacts will be minimized through mitigation measures.

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1.3 Site Overview and Background (TCR)

The Site includes the property known as the Kennedy Lands, which is located at 3432 Greenbank Road, Ottawa, Ontario (Part of Lot 12, Concession 3, Nepean) (the Site) (Figure 1). The Site is approximately 23 hectares in size and is proposed to be developed as a residential subdivision. At the current time, the Site is mostly vacant and includes a mixture of Cultivated Fields, Cultural Meadows (Graminoid Dominated), and Deciduous Hedgerows. The Site also includes three (3) minor drainage features, which are identified as minor tributaries of the Clarke Drain. The three (3) minor drainage features are aligned in an approximately south-north direction. Six (6) existing agricultural structures are found within the Site. The area north of the Site consists of agricultural lands on an adjacent property, beyond which is the Jock River. The alignment of the Jock River is such that the river occurs within close proximity to both the northwest corner of the Site and the eastern part of the Site. The area south of the Site includes a recently constructed residential subdivision. The area southwest and west of the Site includes a residential subdivision that is currently under construction. The Site has a very gradual slope from the south towards the north (e.g. towards the Jock River). The Site elevation varies between approximately 93 m and 95 m Above Sea Level (ASL), sloping down to approximately 90 m ASL adjacent to the Jock River.

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April 2022

FIGURE 1: SITE OVERVIEW

Kennedy Lands (3432 Greenbank Road), Ottawa, Ontario
Combined Environmental Impact Statement (EIS) & Tree Conservation Report (TCR)

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

- Site Boundary
- Agricultural Structures

1.4 Description of Undertaking (TCR)

The Concept Plan for the Kennedy Lands development is included below. The Site is proposed to be developed to accommodate a mix of single detached homes, executive townhomes, and avenue townhomes. A 0.73 ha Parkland Block is shown in the northern part of the Site. The Concept Plan also includes a 0.69 ha Stormwater Management Block. The Stormwater Management Block will accommodate a portion of a new Stormwater Management (SWM) Pond, with the remainder of the SWM Pond located within the adjacent residential subdivision. The new SWM Pond will provide SWM services for the Site. The Site will receive municipal sewer and water. As shown in the Concept Plan, the City of Ottawa plans to realign Greenbank Road through the Site.

Two (2) Natural Feature Blocks are shown in the Concept Plan. In order to address the presence of the 1:100 year floodplain of the Jock River, the Natural Feature Blocks have been positioned adjacent to the Jock River in the eastern and northwestern parts of the Site. Although the two (2) Natural Feature Blocks contain portions of the 1:100 year floodplain of the Jock River, portions of the floodplain also overlap the proposed development area. As such, a cut and fill operation will be required in order to address areas where the proposed development and the floodplain overlap (Refer to Section 4.2.4 for additional detail). Following the completion of the cut and fill works, the two (2) Natural Feature Blocks will be ecologically restored by planting locally appropriate native trees and shrubs in any areas that currently lack vegetation. The two (2) Natural Feature Blocks also provide minimum 30 m wide setbacks from the Jock River. Existing trees and vegetation will be retained within the two (2) Natural Feature Blocks. Trees throughout the remainder of the Site will be removed in order to accommodate the planned development.

The three (3) minor drainage features are identified as minor tributaries of the Clarke Drain. Drainage Feature A and Drainage Feature B will be decommissioned during the development of the Site. The remnant portion of Drainage Feature C will be retained within the Natural Feature Block in the northwest corner of the Site (Refer to Section 4.2.3 for additional detail).

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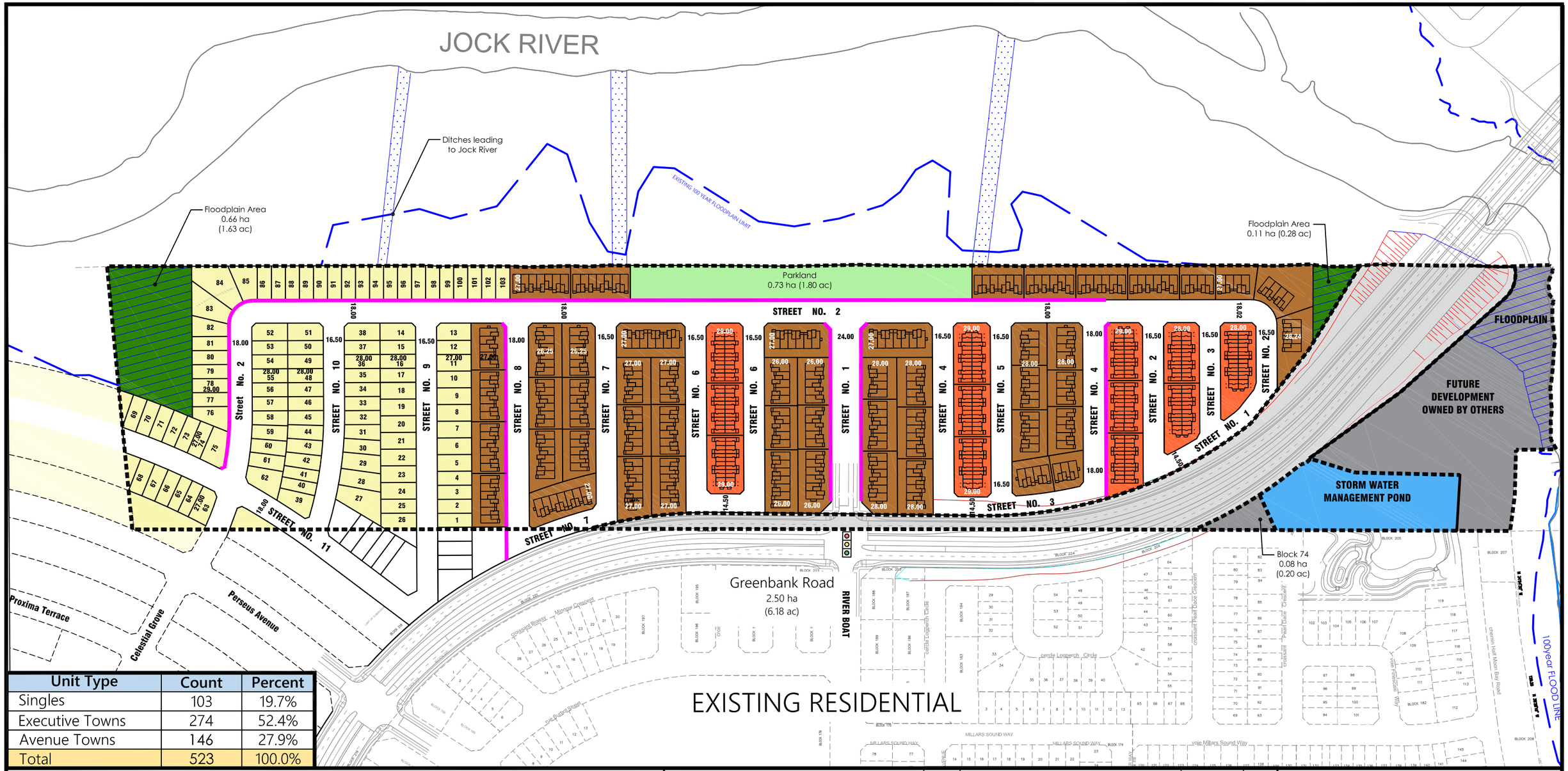

Unit Type	Count	Percent
Singles	103	19.7%
Executive Towns	274	52.4%
Avenue Towns	146	27.9%
Total	523	100.0%

Legend

- Single Detached Homes
- Executive Towns
- Avenue Towns
- Storm Water Management (SWM) Pond
- Parkland
- Land Owned by Others
- Area within Floodplain
- Natural Feature | Area within Floodplain
- Open Space / Pathways
- Sidewalk Locations
- Property Boundary
- Proposed Extent of Greenbank Grading

No.	Description	Date	By
0	Issued for Review	2/25/2022	K.G.

Revisions

Title: **Concept Plan 26**

Project: **Kennedy Lands**

North

Scale: **NTS**

Drawn By: K.G.
Checked By: CS

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1.5 Agency Consultation

A pre-consultation meeting was held with the City of Ottawa. The pre-consultation meeting comments were reviewed prior to the preparation of this Combined Environmental Impact Statement (EIS) and Tree Conservation Report (TCR). Prior to the preparation of this Combined EIS and TCR, a preliminary assessment of the three (3) minor drainage features (minor tributaries of the Clarke Drain) was prepared and submitted to the Rideau Valley Conservation Authority (RVCA). The RVCA provided comments with respect to the three (3) minor drainage features. In their comments, the RVCA confirmed that a Headwaters Drainage Assessment (HDA) was required to support the evaluation of the three (3) minor drainage features. The HDA was prepared concurrently with this Combined EIS and TCR and is available under separate cover (Refer to MES 2022). The Ontario Ministry of Natural Resources and Forestry (OMNRF) Kemptville District *Potential Species at Risk List for the Geographic Township of Nepean* (Appendix C) is referenced below in Section 3.7. As described in greater detail below, the presence of nesting Barn Swallows (threatened) within the Site will be addressed by Minto Communities through the Ministry of Environment, Conservation, and Parks (MECP) Endangered Species Act (ESA) Online Impact Registration Process. No other significant Species at Risk (SAR) concerns were identified.

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1.6 Regulatory Requirements (TCR)

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

- **Ontario Endangered Species Act (ESA):** Barn Swallows (threatened) were found nesting within the Site (refer to Section 3.7.1 for additional detail). The six (6) agricultural structures that are found within the Site will be demolished by Minto Communities to accommodate the planned realignment of Greenbank Road through the Site. The rules and regulations of the Ontario ESA require that prior to the demolition of buildings containing Barn Swallow nests, the demolition activity must be registered through the Ministry of Environment, Conservation, and Parks (MECP) Online Impact Registration Process. The MECP Online Impact Registration Process for Barn Swallows will be completed by Minto Communities prior to the commencement of building demolition. Minto Communities plans to complete the MECP Online Impact Registration Process and the building demolition in late 2022 (pending obtainment of the necessary authorizations). Further details with respect to the Barn Swallow mitigation and habitat compensation requirements are described below in Section 4.4.1. No other significant Species at Risk (SAR) concerns have been identified.
- **Ontario Regulation 174/06:** Ontario Regulation 174/06 regulates activities that would alter shorelines, watercourses, and wetlands. The Jock River and the three (3) minor drainage features (minor tributaries of the Clarke Drain) are regulated by the Rideau Valley Conservation Authority (RVCA) under O.Reg 174/06. As described below in Section 4.2.1, the two (2) Natural Feature Blocks are anticipated to be sufficient to provide minimum 30 m wide setbacks from the Jock River. As such, an authorization with respect to potential impacts to the Jock River is not anticipated to be required. The proposed decommissioning of Drainage Feature A and Drainage Feature B will require approval from the RVCA under O.Reg 174/06. The decommissioning of Drainage Feature A and Drainage Feature B is discussed below in Section 4.2.3.
- **Fisheries Act:** As described below in Section 4.2.1, the two (2) Natural Feature Blocks are anticipated to be sufficient to preserve the natural features and functions of the Jock River. As such, no significant impacts to fish and/or fish habitat within the Jock River are anticipated to result from the development. A Fisheries Act Authorization (05-HCAA-CA4-01840) was obtained to support the construction of the adjacent subdivision (located south of the Site). The Fisheries Act Authorization was originally obtained in 2010, and then renewed in 2013 and 2015. The Fisheries Act Authorization authorized the removal of the upstream portions of the three (3) minor drainage features (minor tributaries of the Clarke Drain). The Fisheries Act review process requires proponents to assess downstream impacts associated with their proposed project. During the Fisheries Act review process for the adjacent subdivision, Fisheries and Oceans Canada would have been aware that the removal of the upstream portions of the three (3) minor drainage

features would result in the degradation of the downstream portions of those features (e.g. the portions of the three (3) minor drainage features that occur within the current Site). Implementation of the Fisheries Act Authorization (e.g. the removal of the upstream portions of the three (3) minor drainage features) implies the removal of hydrological functionality for the immediately downstream area (e.g. the portions of the three (3) minor drainage features that occur within the Site). By extension, the implementation of the Fisheries Act Authorization also implies the removal of any potential fish habitat functions within immediately downstream areas (e.g. the portions of the three (3) minor drainage features within the Site). As such, it is reasonable to conclude that it was anticipated that the implementation of the Fisheries Act Authorization for the adjacent subdivision would remove any significant fish habitat functions which may otherwise have existed within the portions of the three (3) minor drainage features that occur within the current Site. As described below in Section 3.4.2 and Section 3.4.3, the three (3) minor drainage features currently provide negligible hydrological functions, and hence they are unlikely to provide any significant fish habitat functions. No significant impacts to fish habitat are anticipated to occur as a result of the proposed decommissioning of Drainage Feature A and Drainage Feature B. As such, a review and/or authorization under the Fisheries Act is unlikely to be required to support the decommissioning of Drainage Feature A and Drainage Feature B.

- **Tree Removal Permit:** Minto Communities will be required to obtain a Tree Removal Permit under the City of Ottawa Urban Tree Conservation By-law No. 2020-340 prior to the commencement of tree clearing. The Tree Removal Permit is typically issued following the acceptance of the Tree Conservation Report.

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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 July 29th, 2020 and September 17th, 2020. Weather conditions during the July 29th Site visit included temperatures of 22 ºC and partly cloudy skies. Weather conditions during the September 17th Site visit included temperatures of 14 ºC and sunny skies. Additional Site visits to inventory plants and measure tree sizes were completed by Dr. McKinley on May 26th, 2021, June 2nd, 2021, and June 10th, 2021. Weather conditions during the May 26th Site visit included temperatures of 22 ºC and partly cloudy skies. Weather conditions during the June 2nd Site visit included temperatures of 17 ºC and sunny skies. Weather conditions during the June 10th Site visit included temperatures of 18 ºC and sunny skies. 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 community labels described in the Ecological Land Classification (ELC) manual (OMNRF 1998; Lee 2008). A three (3) season plant inventory was completed to document the occurrence of plants, to create a Plant List (Appendix A), and to identify and delineate plant communities. As described below in Section 3.3, there are no areas of continuous forest cover within the Site. Tree cover within the Site is limited to several Deciduous Hedgerows. As such, forest sampling plots were not required. Instead, representative tree size measurements were taken throughout the Deciduous Hedgerows. Trees were measured with the use of a D-tape, which is a calibrated dbh tape.

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2.0.2 Environmental Impact Statement Methodology and Species at Risk Surveys

The potential 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 the habitat of Species at Risk (SAR), wetlands, fish habitat, Significant Wildlife Habitat (SWH) features, and other significant habitat features to be present;
- Examination of aerial imagery to evaluate landscape features;
- Natural Heritage Information Center (NHIC) database review (OMNRF 2021);
- Review of the Ontario Ministry of Natural Resources and Forestry (OMNRF) *Potential Species at Risk List for the Geographic Township of Nepean* (Appendix C); and
- Review of Official Plan designations.

Detailed assessments of natural heritage features were completed as follows:

- **Plant Inventory and Ecological Land Classification:** See description above.
- **Butternut Trees:** The Site was searched for the presence of Butternut Trees (endangered) during the July 29th, 2020 Site visit. An additional survey for Butternut Trees was completed within the adjacent hedgerows located north of the Site on May 26th, 2021. The July 29th, 2020 and the May 26th, 2021 Site visits occurred during the Butternut growing season. No Butternut Trees were found within the Site and/or within the adjacent hedgerows located north of the Site, and therefore a follow-up Butternut Health Assessment (BHA) was not required.
- **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 observed within the Site. The OMNRF (2011a) 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. As described below in Section 3.3, no deciduous or mixed forest habitats were found within the Site. As such, a bat maternity roost assessment was not required.
- **Barn Swallows:** All accessible interior and exterior surfaces of the six (6) agricultural structures that are found within the Site were searched for evidence of Barn Swallow nesting during the July 29th, 2020 Site visit. The July 29th, 2020 Site visit occurred during the Barn Swallow nesting season. As described below in Section 3.7.1, several Barn Swallows and Barn Swallow nests were observed within the Site. Observations of Barn Swallows foraging throughout the Site were also recorded during the Breeding Bird Surveys (see below).
- **Breeding Bird Surveys (Bobolink and Eastern Meadowlark):** In order to assess the potential presence of breeding Bobolink and Eastern Meadowlark, as well as the presence of other breeding birds, Breeding Bird Surveys were completed on May 26th, June 2nd, and June 10th, 2021. Each of

the Breeding Bird Surveys was completed in the early morning between 6 am and 9 am. Weather conditions during the May 26th Site visit included temperatures of 22 ºC and partly cloudy skies. Weather conditions during the June 2nd Site visit included temperatures of 17 ºC and sunny skies. Weather conditions during the June 10th Site visit included temperatures of 18 ºC and sunny skies. The surveys were undertaken following the Ontario Ministry of Natural Resources and Forestry (OMNRF) *Wildlife Monitoring Programs and Inventory Techniques - Technical Manual* (Konze & McLaren 1998) Breeding Bird Survey (BBS) method. The timing and methodology of the surveys followed the requirements outlined in the OMNRF *Survey Methodology under the Endangered Species Act: Dolichonyx oryzivorus (Bobolink)* (OMNRF 2011b). The bird survey points are shown below in Figure 2.

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FIGURE 2: BIRD SURVEY SITES

Kennedy Lands (3432 Greenbank Road), Ottawa, Ontario
Combined Environmental Impact Statement (EIS) & Tree Conservation Report (TCR)

- Site Boundary
- Bird Survey Sites

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

2.0.3 Headwaters Drainage Assessment Methodology

Site visits to preliminarily assess the ecological functions of the three (3) minor drainage features (minor tributaries of the Clarke Drain) were completed on July 29th, 2020 and September 17th, 2020. Weather conditions during the July 29th, 2020 Site visit included temperatures of 22 ºC and partly cloudy skies. Weather conditions during the September 17th, 2020 Site visit included temperatures of 14 ºC and sunny skies. Following the preliminary assessment of the three (3) minor drainage features in 2020, a full Headwaters Drainage Assessment (HDA) was undertaken in 2021. The Headwaters Drainage Assessment has been prepared under separate cover (Refer to MES 2022).

The field component of the HDA was undertaken following the *Evaluation, Classification and Management of Headwater Drainage Features Guideline* (TRCA 2014). The Survey Sites included 40 m upstream and 40 m downstream of each constriction or confluence. As shown in Figure 3, five (5) Survey Sites were required. Upstream and downstream drainage feature segments were measured at each of the five (5) Survey Sites. The Site surveys included the following:

- **OSAP Module S4.M10 – Assessing Headwaters Drainage Features (Stanfield et al. 2013):** This includes an assessment of hydrological and physical functions. The parameters measured included the watercourse type, flow regime, wetted width, water depth, hydraulic head, bankfull width, channel depth, substrate, and riparian corridor vegetation. Flow and water measurements were completed on March 24th (spring freshet), May 26th (late spring), and July 11th, 2021 (mid-summer). The channel measurements were completed during the March 24th, 2021 Site visit.
- **Marsh Monitoring Program – Amphibian Call Count Surveys (Konze and McLaren 1998):** Amphibian breeding habitat was identified according to the *Marsh Monitoring Program – Amphibian Call Count Surveys 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. Surveys were conducted on April 19th, May 18th, and June 15th, 2021. Weather conditions on April 19th included clear skies and temperatures of 13 ºC. Weather conditions on May 18th included temperatures of 22 ºC and clear skies. Weather conditions on June 15th included clear skies and temperatures of 18 ºC. The amphibian call counts were conducted in the upstream and downstream segments of each Survey Site.

Due to the limited hydrological functions of the three (3) minor drainage features, targeted fish surveying was not required. Refer to the concurrently prepared Headwaters Drainage Assessment (MES 2022) for further details.

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FIGURE 3: HDA SURVEY SITES

Kennedy Lands (3432 Greenbank Road), Ottawa, Ontario
Combined Environmental Impact Statement (EIS) & Tree Conservation Report (TCR)

- Site Boundary - Minor Drainage Features 1 - Headwaters Drainage Assessment (HDA) Survey Sites

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

3.0 EXISTING CONDITIONS

3.1 Geological Conditions

The majority of the surface area of the Site includes Cultivated Fields that are planted with corn and Cultural Meadows (Graminoid Dominated). The Cultivated Fields and the Cultural Meadows (Graminoid Dominated) include soil at the surface. No bedrock outcrops were observed within the Site. The Site has a very gradual slope from the south towards the north (e.g. towards the Jock River). The Site elevation varies between approximately 93 m and 95 m Above Sea Level (ASL), sloping down to approximately 90 m ASL adjacent to the Jock River.

3.2 Site History (TCR)

Air photos from 1976 and 1991 are included below (Photos from City of Ottawa 2021). Recent air photos are included in the report figures. The overall composition of the Site was similar to current conditions in 1976, with most of the Site intensively farmed. Relatively few trees are visible within the Site in 1976, suggesting that the Deciduous Hedgerows began growing at a later date. In 1991, again the overall composition of the Site was similar to current conditions, with most of the Site intensively farmed. Tree cover at the Site edges and within the Deciduous Hedgerows increased by 1991 (compared to 1976). However, tree cover within the Deciduous Hedgerows remains sparse in 1991. This suggests that while some trees that currently occur within the Deciduous Hedgerows are approximately 30 years of age, the majority of stems began growing after 1991, and hence are <30 years of age.

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Historic Air Photograph 1: Historic Air Photo from 1976 (Site limits shown in red). Note that the overall composition of the Site was similar to current conditions in 1976, with most of the Site intensively farmed. Relatively few trees are visible within the Site in 1976, suggesting that the Deciduous Hedgerows began growing at a later date (Photos from City of Ottawa 2021).

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Historic Air Photograph 2: Historic Air Photo from 1991 (Site limits shown in red). Note that the overall composition of the Site was similar to current conditions in 1991, with most of the Site intensively farmed. Tree cover at the Site edges and within the Deciduous Hedgerows increased by 1991 (compared to 1976). However, tree cover within the Deciduous Hedgerows remains sparse in 1991 (Photos from City of Ottawa 2021).

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3.3 Vegetation Communities (TCR)

Vegetation communities found within the Site are shown below in Figure 4. Refer to the Plant List (Appendix A) for a complete list of plants found within the Site. The Site includes the following terrestrial vegetation communities:

- **Corn Fields:** Four (4) large corn fields are present in the western part of the Site.
- **Cultural Meadows (Graminoid Dominated):** The eastern part of the Site includes several patches of Cultural Meadow (Graminoid Dominated) which are managed as hayfields. The Cultural Meadows (Graminoid Dominated) are dominated by Brome Grass, Meadow Grass, and Timothy. Forb plants include Canada Thistle, Ox-eye Daisy, Bird's Foot Trefoil, White Clover, Red Clover, Common Strawberry, White Sweet Clover, Common Buttercup, Common Speedwell, and Tufted Vetch. The Cultural Meadows (Graminoid Dominated) do not include any significant tree or shrub cover.
- **Deciduous Hedgerows (Dense):** Several connected Deciduous Hedgerows (Dense) are present within the Site. The Deciduous Hedgerows (Dense) are highly disturbed features which are dominated by declining White Ash (impacted by the Emerald Ash Borer), invasive Manitoba Maple, and American Elm. Bur Oak, Basswood, White Cedar, White Spruce, and Silver Maple are also present, however, White Ash and Manitoba Maple account for a very high proportion of all stems. A single Black Walnut was observed in the northwest corner of the Site. The majority of trees are relatively young and are <30 cm diameter at breast height (dbh) in size. A few isolated Manitoba Maple and White Ash stems up to 60 cm dbh in size occur sporadically. Large White Ash throughout the Site are either dead or in very poor condition, due to the effects of the invasive Emerald Ash Borer. There is also a cluster of approximately six (6) larger Bur Oaks in the Deciduous Hedgerows (Dense) at the western side of the Cultural Meadows (Graminoid Dominated). The largest Bur Oak is 67 cm dbh in size. Shrub cover is dense throughout the Deciduous Hedgerows (Dense) and includes Common Buckthorn, Wild Red Raspberry, Staghorn Sumac, Lilac, Tartarian Honeysuckle, Domestic Apple, and Hawthorn. Groundcover within the Deciduous Hedgerows (Dense), as well as at the edges of the Corn Fields and the Cultural Meadows (Graminoid Dominated), includes Common Ragweed, Common Milkweed, Canada Goldenrod, Canada Thistle, Bull Thistle, Ox-eye Daisy, Common Burdock, Chickory, Wild Parsnip, Yellow Rocket, Red Clover, White Clover, Dandelion, Queen Anne's Lace, Daisy Fleabane, Common Buttercup, Sow Thistle, Virginia Creeper, Riverbank Grape, and Common Stinging Nettle.
- **Deciduous Hedgerows (Sparse):** The Deciduous Hedgerows (Sparse) have generally the same species composition as described above for the Deciduous Hedgerows (Dense). The Deciduous Hedgerows (Sparse) differ from the Deciduous Hedgerows (Dense) primarily in terms of the density and size of trees. The Deciduous Hedgerows (Dense) are dominated by trees up to

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approximately 30 cm dbh in size, whereas the Deciduous Hedgerows (Sparse) are dominated by shrubs and very young tree stems (<10 cm dbh in size).

There are no forest habitats present within the Site and/or in the immediately surrounding area. As such, there are no features found in association with the Site which have the potential to qualify as a Significant Woodlot.

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FIGURE 4: VEGETATION COMMUNITIES

Kennedy Lands (3432 Greenbank Road), Ottawa, Ontario

Combined Environmental Impact Statement (EIS) & Tree Conservation Report (TCR)

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

- Site Boundary

Photograph 1: Looking southeast across the Cultural Meadow (Graminoid Dominated) in the eastern part of the Site. The recently constructed adjacent subdivision is visible in the background (May 26th, 2021).

Photograph 2: Looking south across the Cultivated Field planted with corn in the western part of the Site. The recently constructed adjacent subdivision is visible in the background (June 10th, 2021).

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Photograph 3: Looking north at the Deciduous Hedgerow (Dense) in the eastern part of the Site (July 29th, 2020).

Photograph 4: Looking west at the Deciduous Hedgerow (Dense) in the northern part of the Site (July 29th, 2020).

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Photograph 5: Looking west at the Deciduous Hedgerow (Dense) adjacent to the Cultural Meadow (Graminoid Dominated) (July 29th, 2020).

Photograph 6: Looking south at the Deciduous Hedgerow (sparse) in the central part of the Site (July 29th, 2020).

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3.4 Wetlands and Watercourses

There are no wetland features found within the Site. There are also no unevaluated wetlands shown to exist within 30 m of the Site, and no Provincially Significant Wetlands shown to exist within 120 m of the Site (City of Ottawa 2021; OMNRF 2021). As such, wetlands are not anticipated to be a significant concern for the proposed development. Drainage features found within and/or adjacent to the Site are shown below in Figure 5. Drainage features found within and/or adjacent to the Site include the Jock River and the three (3) minor drainage features (minor tributaries of the Clarke Drain). These features are described in the following sections.

3.4.1 Jock River

The alignment of the Jock River is such that the river occurs within close proximity to both the northwest corner of the Site and the eastern part of the Site. Adjacent to the eastern part of the Site, the Jock River is approximately 35 m wide. The Jock River is permanently hydrated and conveys substantial flows throughout the year. In the vicinity of the eastern part of the Site, the substrate of the river consists primarily of flat rock and boulders. There is relatively little instream aquatic vegetation present immediately adjacent to the Site. The Jock River provides direct fish habitat for a diverse fish community, and is considered a Significant Wildlife Habitat feature (RVCA 2016). The City of Ottawa Natural Heritage System Overlay (Official Plan Schedule L3) shows the Jock River and its associated floodplain as part of the City of Ottawa Natural Heritage System (City of Ottawa 2014). The proposed setbacks from the Jock River are described below in Section 4.2.1.

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FIGURE 5: MINOR DRAINAGE FEATURES

Kennedy Lands (3432 Greenbank Road), Ottawa, Ontario
Combined Environmental Impact Statement (EIS) & Tree Conservation Report (TCR)

- Site Boundary
- Minor Drainage Features (Clarke Drain Minor Tributaries)

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

Photograph 7: Looking north along the Jock River adjacent to the eastern part of the Site (July 29th, 2020).

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3.4.2 Clarke Drain Minor Tributaries

There are three (3) minor drainage features within the Site, each of which is oriented in a south-north direction. The three (3) minor drainage features have been assessed in detail as part of the concurrently prepared Headwaters Drainage Assessment (HDA) (MES 2022). The following is a summary of the HDA results and conclusions. Refer to the HDA (MES 2022) for additional detail.

Each of the three (3) minor drainage features is shown to be a minor tributary of the Clarke Drain (City of Ottawa 2021). Historically, the three (3) minor drainage features were each fed by surface runoff and overland flow coming from the south. However, the upstream portions of each of the three (3) minor drainage features have been decommissioned as part of the construction of the adjacent residential subdivision. The stormwater management system for the adjacent residential subdivision is likely to intercept the majority of overland stormwater flow coming from the south, which may otherwise have been conveyed to the three (3) minor drainage features. The construction of the adjacent residential subdivision has therefore significantly altered the hydrology of the three (3) minor drainage features, such that they no longer receive significant surface runoff and/or overland flow from upstream areas. At the current time, it is likely that hydrological inputs to the three (3) minor drainage features are limited to surface runoff from the adjacent agricultural fields (within the Site). Due to the relatively small size of the surrounding drainage area, it is unlikely that surface runoff from the adjacent fields (within the Site) is sufficient to maintain significant hydrological functions within the three (3) minor drainage features.

MES (2022) identifies that all three (3) of the minor drainage features are highly degraded channelized drains which provide negligible ecological functions. Drainage Feature A and Drainage Feature B both displayed extremely limited hydrological functions. Both Drainage Feature A and Drainage Feature B occur within narrow deciduous hedgerows, beyond which the riparian zone consists of corn fields and/or the adjacent residential subdivision (located to the south). Drainage Feature C was hydrated by water backed up from the Jock River in the early spring, but displayed very limited hydrological functions throughout the remainder of the survey period. The riparian vegetation surrounding Drainage Feature C consists of a mix of meadow, a narrow hedgerow, and corn fields. No evidence of amphibian breeding habitat was observed in relation to any of the three (3) minor drainage features. No evidence of fish habitat functions was observed in relation to Drainage Feature A and Drainage Feature B. Drainage Feature C may provide minor fish habitat functions during the spring freshet, at which time fish could potentially migrate into the feature from the adjacent Jock River. However, no fish were observed within Drainage Feature C throughout the survey period.

Representative photographs of the three (3) minor drainage features are included below. Refer to the HDA (MES 2022) for additional photographs of the three (3) minor drainage features, including seasonal photographs taken in the early spring, late spring, and summer.

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Photograph 8: Looking south at the northern end of Drainage Feature A (September 17th, 2020).

Photograph 9: Looking south at the central part of Drainage Feature A (July 29th, 2020).

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Photograph 10: Looking south at the southern end of Drainage Feature A (September 17th, 2020).

Photograph 11: Looking south at the adjacent residential subdivision. The area shown historically included the upstream portion of Drainage Feature A (September 17th, 2020).

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Photograph 12: Looking south at the northern end of Drainage Feature B (September 17th, 2020).

Photograph 13: Looking south at the central part of Drainage Feature B (September 17th, 2020).

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Photograph 14: Looking south at the northern end of the remnant portion of Drainage Feature C (September 17th, 2020).

Photograph 15: Looking south at the southern end of the remnant portion of Drainage Feature C (September 17th, 2020).

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Photograph 16: Looking south at the adjacent residential subdivision (under construction). The area shown historically included the upstream portion of Drainage Feature C (September 17th, 2020).

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3.4.3 Fish Habitat

The Rideau Valley Conservation Authority (RVCA) monitors the Jock River as part of their subwatershed monitoring programs. The RVCA has documented thirty six (36) fish species within the Jock River – Barrhaven Catchment. This includes several recreationally targeted species and several species of baitfish (RVCA 2016). The only Species at Risk (SAR) documented within the Jock River by the RVCA is Snapping Turtle (special concern) (discussed below in Section 3.7.3) (RVCA 2016). As described in greater detail below in Section 4.2.1, the two (2) Natural Feature Blocks are anticipated to be sufficient to preserve the natural features and functions of the Jock River. As such, no significant impacts to fish and/or fish habitat within the Jock River are anticipated to result from the development.

The potential presence of fish habitat within the three (3) minor drainage features was assessed in detail by the concurrently prepared Headwaters Drainage Assessment (HDA) (MES 2022). As described in greater detail in MES (2022), standing water depths within Drainage Feature A and Drainage Feature B were ≤11 cm during the spring freshet. Standing water depths varied between 0 cm and 6 cm within Drainage Feature A and Drainage Feature B by late spring, and both features were entirely dry by mid-summer. Standing water depths of 48 cm (downstream) and 26 cm (upstream) were observed within Drainage Feature C during the March 24th (spring freshet) hydrological measurement. The standing water observed within Drainage Feature C on March 24th was likely due to water back-up from the adjacent Jock River, as no upstream connecting channel exists and no flow was observed. Standing water depths declined to ≤4 cm by May 26th (late spring), and Drainage Feature C was entirely dry by July 11th (mid-summer). The standing water depths throughout the Site were too shallow throughout the survey period for fish sampling to be completed using a backpack electrofisher. Fish sampling was instead undertaken with a dip net, however, no fish were found.

The hydrological functions of Drainage Feature A and Drainage Feature B are extremely limited, and therefore it is unlikely that either feature provides any significant fish habitat functions. Water backed up from the Jock River hydrated Drainage Feature C during the spring freshet, at which time fish could potentially migrate into the feature from the Jock River. However, standing water depths within Drainage Feature C declined to ≤4 cm by May 26th (late spring), and therefore the potential fish habitat functions provided by Drainage Feature C are likely to be limited to the very early season (e.g. the spring freshet). As described below in Section 4.2.3, the remnant portion of Drainage Feature C that occurs within the Site will be preserved within the Natural Feature Block in the northwest corner of the Site. The preservation of the remnant portion of Drainage Feature C within the Natural Feature Block is anticipated to be sufficient to protect the potential minor fish habitat functions provided by Drainage Feature C.

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3.5 Adjacent Lands and Significant Features

The area north of the Site consists of agricultural lands on an adjacent property, beyond which is the Jock River. The alignment of the Jock River is such that the river occurs within close proximity to both the northwest corner of the Site and the eastern part of the Site. The area south of the Site includes a recently constructed residential subdivision. The area southwest and west of the Site includes a residential subdivision that is currently under construction. The Jock River is the only significant natural heritage feature located in close proximity to the Site. The City of Ottawa Natural Heritage System Overlay (Official Plan Schedule L3) shows the Jock River and its associated floodplain as part of the City of Ottawa Natural Heritage System (City of Ottawa 2014). 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 Section 3.6 and Section 3.7. No other significant natural heritage features have been identified within the Site and/or immediately adjacent to the Site.

There are no wetland features found within the Site. There are also no unevaluated wetlands shown to exist within 30 m of the Site, and no Provincially Significant Wetlands shown to exist within 120 m of the Site (City of Ottawa 2021; OMNRF 2021). There are no Areas of Natural and Scientific Interest (ANSI) within the Site and/or within 120 m of the Site. As described above, there are no features within the Site, or immediately adjacent to the Site, which have the potential to qualify as Significant Woodlots.

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3.6 Wildlife and Significant Wildlife Habitat

Birds and other wildlife observed within the Site during the Site surveys are listed in Appendix B. During the Site surveys, thirty (30) bird species were observed within the Site. All of the bird species observed within the Site are common species in urban and suburban areas, with the exception of Barn Swallow (threatened) (discussed below in Section 3.7.1). Other wildlife observed within the Site included Eastern Grey Squirrel, Red Squirrel, Eastern Chipmunk, Eastern Cottontail, American Toad, and Northern Leopard Frog.

As discussed below in Section 3.7.1, the habitat of threatened Barn Swallows was identified within the Site. No other significant Species at Risk (SAR) habitat features were identified. The habitat of SAR is considered Significant Wildlife Habitat (SWH) (Refer to Section 3.7.1 for additional detail) (OMNRF 2014b). As described above, the Jock River provides direct fish habitat for a diverse fish community, and the Jock River is therefore considered a SWH feature (RVCA 2016).

The potential presence of fish habitat and amphibian breeding habitat within the three (3) minor drainage features was assessed as part of the concurrently prepared Headwaters Drainage Assessment (HDA) (MES 2022). No evidence of significant fish habitat and/or amphibian breeding habitat was documented in association with the three (3) minor drainage features MES (2022). No evidence of amphibian breeding activity was documented within the Site during the HDA surveying (MES 2022).

Other than the features listed above, no stick nests, migratory bird stopover points, amphibian breeding habitat, heron rookeries, caves, bedrock fissures, wetlands, reptile hibernacula, or any other features which may qualify as SWH were observed within the Site (OMNRF 2014b).

The City of Ottawa *Bird Safe Design Guidelines* identify that buildings which are located in close proximity to natural areas, parks, forests, and wetlands are likely to pose an increased risk of bird collision (City of Ottawa 2020). In addition, buildings that are located along known or suspected migration corridors (e.g. rivers, escarpments, and other linear landscape features) also pose an increased risk of bird collision (City of Ottawa 2020). As described above in Section 3.4, the Site is located in close proximity to the Jock River, which is likely to function as a migration corridor. The buildings that will be constructed as part of the future development may therefore pose an increased risk of bird collision. Portions of the future development will interface with the two (2) Natural Feature Blocks. Future buildings located adjacent to the Natural Feature Blocks may also pose an increased risk of bird collision (City of Ottawa 2020). Mitigation measures to address the risk of bird collision are described below in Section 4.4.2.

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3.7 Species at Risk

3.7.1 Barn Swallow and Chimney Swift

Barn Swallows (threatened) may be found nesting in many anthropogenic structures including old barns and sheds, culverts, and under bridges (SARO 2021). There are currently six (6) agricultural structures within the Site (Refer to Figure 6). Photographs of the six (6) agricultural structures are included below. All accessible interior and exterior surfaces of the six (6) agricultural structures were searched for evidence of Barn Swallow nesting during the July 29th, 2020 Site visit. The July 29th, 2020 Site visit occurred during the Barn Swallow nesting season. The following is a summary of the Barn Swallow survey results:

- **Structure #1 (Sealed Wood Shed):** Structure #1 is a sealed wood shed with a tin roof. The structure does not include any significant openings. The exterior surfaces of Structure #1 were examined, and no evidence of Barn Swallow nesting was observed.
- **Structure #2 (Tractor Garage):** Structure #2 is a tractor garage with tin walls and a tin roof. A large door provides access to the interior of Structure #2. The interior and exterior surfaces of Structure #2 were examined, and two (2) active Barn Swallow nests were found. Three (3) adult Barn Swallows were observed foraging in the vicinity of Structure #2, indicating that the nests were likely being utilized by Barn Swallows in July 2020.
- **Structure #3 (Plastic Coverall):** Structure #3 is a plastic coverall with a metal frame and open sides. The interior and exterior surfaces of Structure #3 were examined, and no evidence of Barn Swallow nesting was observed.
- **Structure #4 (Wooden Barn):** Structure #4 is a wooden barn with a tin roof. The wooden barn is sealed, although many small gaps are present within the walls of the structure. The gaps do not appear large enough to allow Barn Swallows to enter, and no evidence of Barn Swallow nesting was observed.
- **Structure #5 (Hay Storage Area):** Structure #5 is a hay storage area with wood walls and a tin roof. The structure is permanently open on one side, and hence is accessible to nesting birds. One (1) Barn Swallow nest was observed within the interior of Structure #5. The Barn Swallow nest appeared partially degraded and no adult birds were observed to be in attendance. As such, the nest may not have been used in July 2020.
- **Structure #6 (Open Hay Storage Area):** Structure #6 is an open hay storage area which includes a tin roof suspended on top of four (4) wooden pillars. The structure does not include any exterior walls. The interior and exterior surfaces of Structure #6 were examined, and no evidence of Barn Swallow nesting was observed.

In summary, evidence of Barn Swallow nesting was observed in Structure #2 and Structure #5. Barn Swallow regulatory requirements are discussed below in Section 4.4.1. Chimney Swifts (threatened)

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may be found nesting in suitable chimneys (SARO 2021). As described above, none of the six (6) agricultural structures has a chimney. Therefore, Chimney Swifts are unlikely to be a significant concern for the future development.

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FIGURE 6: STRUCTURE LOCATIONS

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Combined Environmental Impact Statement (EIS) & Tree Conservation Report (TCR)

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

- Site Boundary
- Agricultural Structures

Photograph 17: Structure #1 (Sealed Wood Shed). No Barn Swallow nests were observed within Structure #1 (July 29th, 2020).

Photograph 18: Structure #2 (Tractor Garage). Two (2) active Barn Swallow nests were observed within Structure #2 (July 29th, 2020).

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Photograph 19: Active Barn Swallow nest within Structure #2 (July 29th, 2020).

Photograph 20: Active Barn Swallow nest within Structure #2 (July 29th, 2020).

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Photograph 21: Structure #3 (Plastic Coverall). No Barn Swallow nests were observed within Structure #3 (July 29th, 2020).

Photograph 22: Structure #4 (Wooden Barn). No Barn Swallow nests were observed within Structure #4 (July 29th, 2020).

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Photograph 23: Structure #5 (Hay Storage Area). One (1) Barn Swallow nest was observed within Structure #5 (July 29th, 2020).

Photograph 24: Barn Swallow nest within Structure #5 (July 29th, 2020).

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Photograph 25: Structure #6 (Open Hay Storage Area). No Barn Swallow nests were observed within Structure #6 (July 29th, 2020).

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3.7.2 Bobolink and Eastern Meadowlark

Bobolink (threatened) and Eastern Meadowlark (threatened) are found nesting in grasslands, old pastures, hayfields, and meadows (SARO 2021). Both species prefer open habitat dominated by graminoid plants (e.g. grasses). The Cultivated Fields planted with corn in the western part of the Site do not provide potentially suitable habitat for nesting Bobolink and/or Eastern Meadowlark. The Cultural Meadows (Graminoid Dominated) in the eastern part of the Site have the potential to provide habitat for these species. However, no evidence of Bobolink and/or Eastern Meadowlark activity was observed within the Site during the 2021 Breeding Bird Surveys. As such, Bobolink and Eastern Meadowlark are unlikely to be a significant concern for the proposed development.

3.7.3 Additional Species at Risk

The Natural Heritage Information Center (NHIC) records for the nine (9) grids that include and surround the Site were reviewed. This included an area 3 km x 3 km in size and all published Species at Risk (SAR) records were noted (OMNRF 2021). The Ontario Ministry of Natural Resources and Forestry (OMNRF) *Potential Species at Risk List for the Geographic Township of Nepean* was also reviewed (Appendix C). In addition to Barn Swallow, Chimney Swift, Bobolink, and Eastern Meadowlark (discussed above), the following SAR were identified as potentially occurring within the vicinity of the Site:

- American Eel – Endangered
- Lake Sturgeon – Threatened
- Hickorynut - Endangered
- River Redhorse – Special Concern
- Silver Lamprey – Special Concern
- Black Ash Trees - Endangered
- Butternut Trees – Endangered
- Bank Swallow - Threatened
- Blanding's Turtle – Threatened
- Eastern Whip Poor Will – Threatened
- Least Bittern - Threatened
- Loggerhead Shrike – Endangered
- Hudsonian Godwit - Threatened
- Piping Plover – Endangered
- Red Knot (Rufa Subspecies) – Endangered
- Red Necked Phalarope – Special Concern
- Eastern Small Footed Myotis – Endangered
- Little Brown Bat – Endangered
- Northern Long Eared Bat – Endangered

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- Tricolored Bat – Endangered
- Gypsy Cuckoo Bumblebee – Endangered
- Rusty Patched Bumblebee – Endangered
- Yellow Banded Bumblebee – Special Concern
- Transverse Lady Beetle – Endangered
- Bald Eagle – Special Concern
- Black Tern – Special Concern
- Horned Grebe – Special Concern
- Eastern Wood Pewee – Special Concern
- Wood Thrush – Special Concern
- Evening Grosbeak – Special Concern
- Peregrine Falcon – Special Concern
- Red Headed Woodpecker - Endangered
- Rusty Blackbird – Special Concern
- Midland Painted Turtle – Special Concern
- Northern Map Turtle – Special Concern
- Snapping Turtle – Special Concern
- Monarch Butterfly – Special Concern

The following is a summary of the potential for these species to occur within the Site:

- **American Eel, Lake Sturgeon, River Redhorse, Silver Lamprey, and Hickorynut:** American Eel and Lake Sturgeon are fish species that are found in association with the Ottawa River (SARO 2021). River Redhorse and Silver Lamprey are also fish species which are primarily found in riverine environments and major tributaries (SARO 2021). Hickorynut is a freshwater mussel found in association with the Ottawa River (SARO 2021). As described above in Section 3.4.3, the Rideau Valley Conservation Authority (RVCA) monitors the Jock River as part of its subwatershed monitoring programs. The RVCA has documented thirty six (36) fish species within the Jock River – Barrhaven Catchment (RVCA 2016). The only Species at Risk (SAR) documented within the Jock River by the RVCA is Snapping Turtle (special concern) (discussed below). As described above in Section 3.4.2, the three (3) minor drainage features are unlikely to provide any significant fish habitat functions. As such, American Eel, Lake Sturgeon, River Redhorse, Silver Lamprey, and Hickorynut are unlikely to be present within the vicinity of the Site. American Eel, Lake Sturgeon, River Redhorse, Silver Lamprey, and Hickorynut are therefore unlikely to be a significant concern for the proposed development.
- **Black Ash Trees:** Black Ash Trees are primarily found growing in swamps and wetlands (SARO 2021). As described above, there are no wetland habitats found within the Site and/or immediately

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adjacent to the Site. No Black Ash Trees were found within the Site during the plant surveys, and therefore Black Ash Trees are unlikely to be a significant concern for the proposed development.

- **Butternut Trees:** Butternut Trees are found in many treed areas throughout the Ottawa region (SARO 2021). The Site was searched for the presence of Butternut Trees during the July 29th, 2020 Site visit. An additional survey for Butternut Trees was completed within the adjacent hedgerows located north of the Site on May 26th, 2021. The July 29th, 2020 and the May 26th, 2021 Site visits occurred during the Butternut growing season. No Butternut Trees were found within the Site and/or within the adjacent hedgerows located north of the Site. As such, Butternut Trees 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 2021). There are no significant areas of exposed sand or silt within the Site and no stockpiles currently exist. As such, Bank Swallows are unlikely to be a significant concern for the proposed development.
- **Blanding's Turtle:** Blanding's Turtle Category 2 habitat includes core wetland and watercourse features used by Blanding's Turtles, and the surrounding terrestrial habitat within 30 m of those features (OMNRF 2014a). Category 1 habitat includes hibernation sites and nesting areas, as well as adjacent terrestrial habitat within 30 m. No evidence of Category 1 or Category 2 Blanding's Turtle habitat features was observed within the Site. As described above in Section 3.4, there are no wetlands within the Site and/or in the immediately surrounding area. Blanding's Turtles are not typically considered a riverine species, and they have not previously been documented in association with the Jock River (RVCA 2016; OMNRF 2021; SARO 2021). The three (3) minor drainage features within the Site are too small, degraded, and ephemeral to provide core Blanding's Turtle habitat functions. Due to the absence of potentially suitable habitat features, Blanding's Turtles are unlikely to be a significant concern for the proposed development.
- **Eastern Whip Poor Will:** 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 canopy conditions (Garlapow 2007). The Site does not include any forest habitat, and therefore it does not provide potentially suitable habitat for Eastern Whip Poor Will. As such, Eastern Whip Poor Will are unlikely to be a significant concern for the proposed development.
- **Least Bittern:** Least Bittern breed in open marshes and wetlands (SARO 2021). As described above in Section 3.4, there are no significant areas of marsh or open wetland habitat within the Site and/or within 30 m. Least Bittern are therefore unlikely to be a significant concern for the proposed development.
- **Loggerhead Shrike:** Loggerhead Shrike are found nesting in large pastures and grasslands with scattered low trees and thorny shrubs. They also nest and forage in alvars (SARO 2021). The Cultural Meadows (Graminoid Dominated) that are present in the eastern part of the Site are too

small to provide suitable habitat for Loggerhead Shrike. Therefore, Loggerhead Shrike are unlikely to be a significant concern for the proposed development.

- **Hudsonian Godwit, Piping Plover, Red Knot (Rufa Subspecies), and Red Necked Phalarope:** Hudsonian Godwit, Piping Plover, Red Knot, and Red Necked Phalarope are shorebird species. Piping Plover nest on sand and gravel beaches (SARO 2021). Hudsonian Godwit and Red Knot occur within the Ottawa area as a rare migrants, and both species are occasionally found foraging on beaches, mudflats, and in coastal lagoons (SARO 2021). Red Necked Phalarope occurs within coastal and inland marshes, where it feeds in shallow ponds and nests in grassy areas near the water's edge (SARO 2021). The Site does not include any beaches, mudflats, coastal lagoons, marshes, or ponds. As described above in Section 3.4.1, the adjacent areas of the Jock River include a rocky shoreline dominated by flat rock and boulders. As such, the Site and the immediately surrounding area does not contain suitable habitat for Hudsonian Godwit, Piping Plover, Red Knot, and Red Necked Phalarope. Hudsonian Godwit, Piping Plover, Red Knot, and Red Necked Phalarope are therefore unlikely to be a significant concern for the proposed development.
- **Eastern Small Footed Myotis, Little Brown Bat, 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 observed within the Site. The OMNRF (2011a) 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. There is no deciduous forest or mixed forest within the Site. Therefore, the Site is unlikely to be suitable for bat maternity roosting, and the endangered bat species are unlikely to be a significant concern for the proposed development.
- **Gypsy Cuckoo Bumblebee, Rusty Patched Bumblebee, and Yellow Banded Bumblebee:** The Gypsy Cuckoo Bumblebee is known from the Ottawa area from historic occurrences only. Most recent sightings of the species within Ontario are from the Pinery Provincial Park near Sarnia (SARO 2021). The Rusty Patched Bumblebee is most frequently found in oak savannah habitats (SARO 2021). Yellow Banded Bumblebee is a habitat generalist which can be found in many habitats with flowering plants (SARO 2021). No Yellow Banded Bumblebees were observed within the Site during the Site surveys. It should be noted that Yellow Banded Bumblebee is a species of special concern, and therefore its habitat is not protected under the rules and regulations of the Ontario Endangered Species Act (ESA). Gypsy Cuckoo Bumblebee, Rusty Patched Bumblebee, and Yellow Banded Bumblebee are unlikely to occur within the Site, and therefore they are unlikely to be a significant concern for the proposed development.
- **Transverse Lady Beetle:** There have been no records of Transverse Lady Beetle in Ontario since 1990 (SARO 2021). As such, Transverse Lady Beetle are unlikely to be a significant concern for the proposed development.

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- **Bald Eagle:** Bald Eagles are primarily found nesting in large trees and forests adjacent to large lakes and rivers (e.g. the Ottawa River) (SARO 2021). As described above in Section 3.3, the Site does not include any large trees and/or forest habitat, and therefore it is unlikely to provide a suitable nesting site for Bald Eagles. As such, Bald Eagles are unlikely to be a significant concern for the proposed development.
- **Black Tern and Horned Grebe**: Black Terns build their nests in shallow marshes (SARO 2021). Horned Grebes nest in small ponds, marshes, and shallow bays (SARO 2021). As described above, there are no marshes, ponds, or shallow bays found within the Site and/or within 30 m. Therefore, Black Terns and Horned Grebes are unlikely to be a significant concern for the proposed development.
- **Eastern Wood Pewee and Wood Thrush**: Eastern Wood Pewee and Wood Thrush are found nesting within interior forest habitat (SARO 2021). As described above in Section 3.3, there is no forest habitat found within the Site. Eastern Wood Pewee and Wood Thrush are therefore unlikely to be a significant concern for the proposed development.
- **Evening Grosbeak**: Evening Grosbeak breed in mature mixed forests dominated by Fir trees, White Spruce, and/or Trembling Aspen (SARO 2021). As described above, there is no forest habitat found within the Site. Evening Grosbeak is therefore unlikely to be a significant concern for the proposed development.
- **Peregrine Falcon:** Peregrine Falcons nest on steep cliff edges and at the top of tall buildings in urban areas (SARO 2021). There are no potentially suitable nest sites for Peregrine Falcons within the Site, and therefore they are unlikely to be a significant concern for the proposed development.
- **Red Headed Woodpecker**: Red Headed Woodpeckers are primarily found in association with open woodlands and woodland edges (SARO 2021). As described above in Section 3.3, there are no woodlands and/or forest habitats found within the Site. Red Headed Woodpeckers are therefore unlikely to be a significant concern for the proposed development.
- **Rusty Blackbird**: Rusty Blackbirds breed in coniferous forest near wetlands (SARO 2021). As described above, there are no forest or wetland habitats found within the Site. Rusty Blackbirds are therefore unlikely to be a significant concern for the proposed development.
- **Midland Painted Turtle, Northern Map Turtle, and Snapping Turtle**: Midland Painted Turtle, Northern Map Turtle, and Snapping Turtle are species of special concern, and therefore their habitat is not regulated under the Ontario ESA. Northern Map Turtle is primarily a riverine species (SARO 2021). Midland Painted Turtles and Snapping Turtles are generally common in many aquatic habitats, and both species have been documented within the Jock River (RVCA 2016; SARO 2021). The three (3) minor drainage features within the Site are too limited in terms of their hydrological functions to provide potential habitat for Northern Map Turtle, Midland Painted Turtle, and/or Snapping Turtle. All three (3) turtle species may be found in the Jock River. As described below in Section 4.2.1, the two (2) Natural Feature Blocks are anticipated to be sufficient to preserve the features and functions of the Jock River. No significant impacts to the Jock River

are anticipated to result from the development, and therefore Midland Painted Turtle, Northern Map Turtle, and Snapping Turtle are unlikely to be a significant concern for the proposed development.

- **Monarch Butterfly:** Monarch Butterflies are found in meadow and grassland habitats in association with their Milkweed host plants (SARO 2021). Common Milkweed was found within the Site within the Deciduous Hedgerows and adjacent to Drainage Feature A. However, Common Milkweed occurs within the Site in low densities. No Monarch Butterflies were observed within the Site during the Site surveys. It should be noted that Monarch Butterflies are a species of special concern, and therefore their habitat is not protected under the Ontario ESA. Mitigation measures to minimize potential impacts to wildlife during vegetation clearing are described below in Section 4.4.3.

In summary, the presence of nesting Barn Swallows was the only significant Species at Risk (SAR) concern identified for the Site. Regulatory requirements for Barn Swallows are discussed below in Section 4.4.1.

3.8 Linkages

The area north of the Site consists of agricultural lands on an adjacent property, beyond which is the Jock River. The alignment of the Jock River is such that the river occurs within close proximity to both the northwest corner of the Site and the eastern part of the Site. The area south of the Site includes a recently constructed residential subdivision. The area southwest and west of the Site includes a residential subdivision that is currently under construction. The Site does not occur between any two (2) adjacent natural heritage features, and the Site is bordered by subdivisions (including those under construction) to the south, southwest, and west. As such, the Site is unlikely to provide any significant linkage functions. The only significant natural heritage feature that is located in close proximity to the Site is the Jock River. The development of the Site will not block connectivity between the Jock River and any other adjacent significant natural heritage features.

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4.0 DESCRIPTION OF ENVIRONMENTAL IMPACTS AND MITIGATION

4.1 Terrestrial Habitat and Tree Removal (TCR)

4.1.1 Tree Retention (TCR)

As described above in Section 3.3, the Site does not include any forest habitat and the majority of the Site lacks mature tree coverage. Tree cover within the Site is limited to several degraded Deciduous Hedgerows. The Deciduous Hedgerows are dominated by dead/dying White Ash and invasive Manitoba Maple, and hence they are heavily disturbed. The majority of the tree stems within the Deciduous Hedgerows began growing after 1991, and are therefore <30 years of age. The Deciduous Hedgerows are not significant ecological features and are not a priority for retention.

The Deciduous Hedgerows (Dense) occur within the eastern part of the Site and along the southern Site boundary. The majority of the Deciduous Hedgerows (Dense) within the eastern part of the Site occur within the planned footprint of the realigned Greenbank Road, and hence they cannot be retained. The Deciduous Hedgerows (Dense) along the southern Site boundary also occur within the planned footprint of the realigned Greenbank Road and/or at the interface between the proposed development and the recently constructed residential subdivision that is located to the south. The retention of portions of the Deciduous Hedgerows (Dense) at the interface between the proposed development and the recently constructed adjacent subdivision is not possible, as the trees would conflict with the development features (e.g. new houses and streets). Experience in the Ottawa area has shown that the retention of individual trees within development lots and/or within the Right of Way of future roads is generally not feasible, due to the required grade changes, hydrological changes, and construction stage impacts that will occur as a result of the development density.

Existing trees and vegetation will be retained within the two (2) Natural Feature Blocks. As described below in Section 4.2.2, the two (2) Natural Feature Blocks will be ecologically restored by planting locally appropriate native trees and shrubs in any areas that currently lack vegetation. Refer to Section 4.2.2 for additional details. Trees throughout the remainder of the Site will be removed in order to accommodate the planned development. Any dead and/or hazardous trees that are present at the edges of the two (2) Natural Feature Blocks will be identified and removed during the tree clearing.

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4.1.2 Tree Preservation Mitigation Measures (TCR)

The following tree preservation mitigation measures will 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 tree protection fencing at least 1 m in height;
- 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;
- Attach signs to the tree protection fencing approximately every 10 m. The signs must identify the purpose of the fencing (e.g. to protect retained trees and their CRZ). The signs must also identify that the tree protection fencing is to be maintained throughout the construction phase of the development, and that the fencing is not to be moved and/or removed until construction is complete;
- 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 of retained trees;
- 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 retained tree;
- Do not attach any signs, notices, or posters to any retained tree;
- Do not damage the root system, trunk, or branches of any retained tree;
- Ensure that exhaust fumes from all equipment are directed away from any retained tree canopy; and
- Disturbed areas of retained natural features should be replanted with locally grown native species.

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4.1.3 Replanting (TCR)

In order to mitigate the loss of woody vegetation from tree clearing, trees and shrubs will be replanted selectively at the back of lots and along roadways. The planting locations and specific planting requirements will be confirmed by a detailed Landscaping Plan. The Jock River is located in close proximity to the development. The Jock River is a significant natural feature which acts as a natural migration and dispersal corridor. As such, the Landscaping Plan must utilize locally appropriate native plant species throughout the development, which may include the native plant species identified in Appendix A. Non-native species and invasive species should not be utilized in the Landscaping Plan. The planting of Ash trees should be avoided due to the high likelihood that any planted Ash trees will become infested with Emerald Ash Borer.

As described below in Section 4.2.2, the two (2) Natural Feature Blocks will be ecologically restored by planting locally appropriate native trees and shrubs in any areas that currently lack vegetation. Refer to Section 4.2.2 for additional details.

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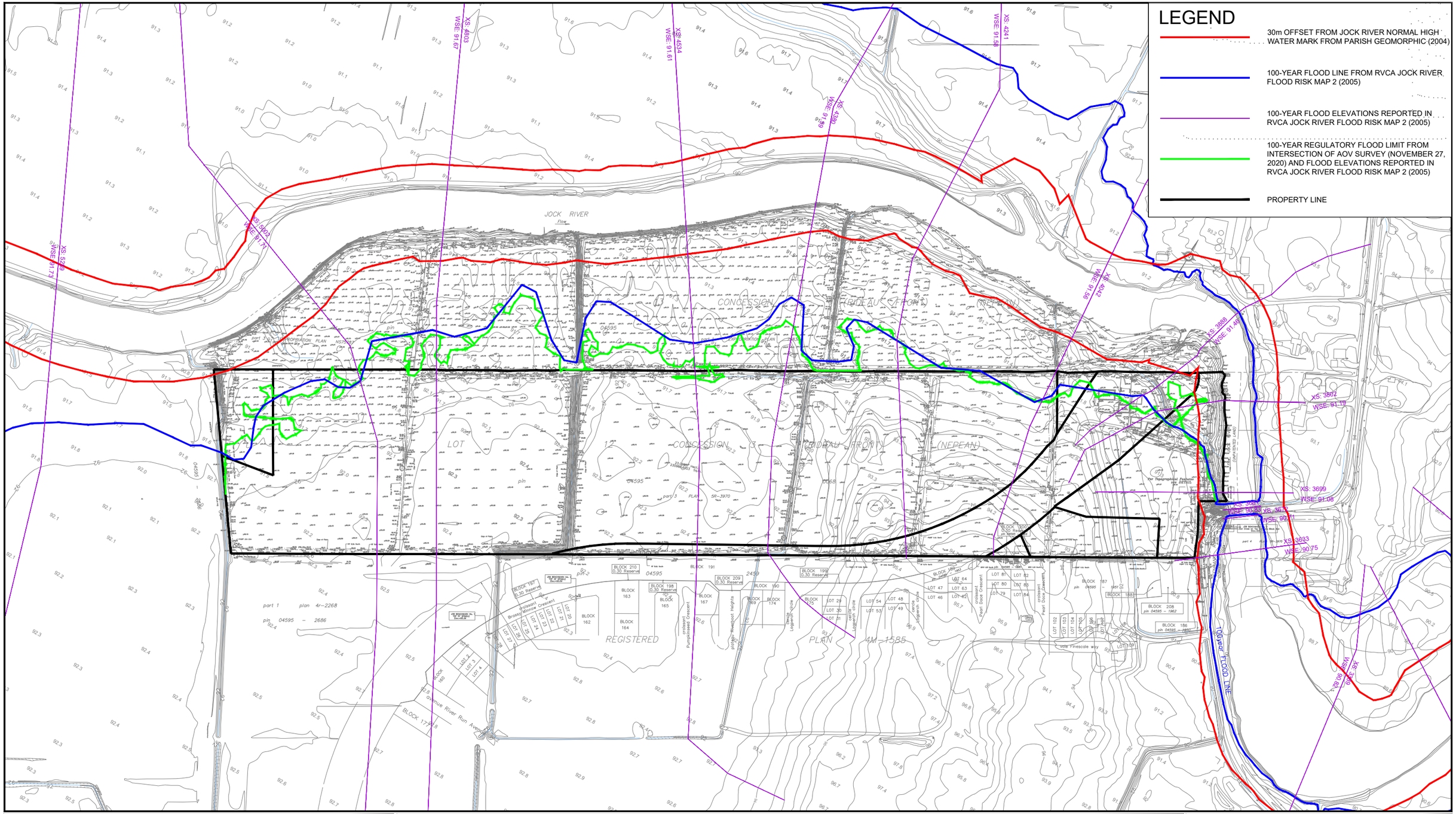
4.2 Watercourses and Aquatic Habitats

4.2.1 Jock River Setbacks

A Constraints Plan is included below. The Constraints Plan illustrates the limits of the regulatory floodplain and the limits of the 30 m wide setbacks from the normal highwater mark of the Jock River. The alignment of the Jock River is such that the river occurs within close proximity to both the northwest corner of the Site and the eastern part of the Site. Two (2) Natural Feature Blocks are shown in the Concept Plan. In order to address the presence of the 1:100 Year Floodplain of the Jock River, the Natural Feature Blocks have been positioned adjacent to the Jock River in the eastern and northwestern parts of the Site. Although the two (2) Natural Feature Blocks contain portions of the 1:100 year floodplain of the Jock River, portions of the floodplain also overlap the proposed development area. As such, a cut and fill operation will be required in order to address areas where the proposed development and the floodplain overlap (Refer to Section 4.2.4 for additional detail).

The *Jock River Reach 1 Subwatershed Plan* (Stantec 2007) recommends the maintenance of minimum 30 m wide setbacks from the Jock River. As shown in the Constraints Plan, the two (2) Natural Feature Blocks provide minimum 30 m wide setbacks from the Jock River. The minimum 30 m wide setbacks from the Jock River provide buffers which will help to slow, filter and absorb overland stormwater flow, while also providing habitat for wildlife and wildlife movement. Trees growing within the setbacks 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 the absorption and filtration of overland stormwater flow. Existing vegetation within the 30 m wide setbacks from the Jock River will be retained during the development of the Site. As described below in Section 4.2.2, the two (2) Natural Feature Blocks will be ecologically restored by planting native trees and shrubs in any areas that currently lack vegetation. The two (2) Natural Feature Blocks are anticipated to be sufficient to preserve the significant features and functions of the Jock River.

The City of Ottawa Official Plan Section 4.7.3 identifies four (4) watercourse setback requirements. These include a requirement to address the regulatory floodplain (discussed above and below in Section 4.2.4), as well as a requirement to provide either a minimum 30 m wide setback from the normal highwater mark or a minimum 15 m wide setback from the existing top of bank (whichever is greater). As illustrated by the topographical mapping that is shown in the Constraints Plan, the top of bank is located in close proximity to the normal highwater mark of the Jock River, and therefore the 30 m wide setback from the normal highwater mark is the larger of the two (2) potential setbacks. Section 4.7.3 of the City of Ottawa Official Plan also requires that the development limits address the presence of geotechnical hazard lands. The Rideau Valley Conservation Authority (RVCA) has not identified any potential geotechnical hazard lands in relation to the Site.



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MINTO KENNEDY LANDS
JOCK RIVER CONSTRAINTS

PROJECT No.:	20-1182
SCALE:	1:4000
DATE:	FEBRUARY 2022
FIGURE:	CONSTRAINTS

z:\projects\20-1182_kennedy-lands\b_design\b2_drawings\b2-5_sketches and figures\2022-02-18_jock_river_constraints_plan\2022-02-18_1182_jock_river_constraints.dwg

4.2.2 Restoration of Natural Feature Blocks (TCR)

The *Jock River Reach 1 Subwatershed Plan* (Stantec 2007) recommends that degraded watercourse corridors surrounding the Jock River should be ecologically restored by planting native trees and shrubs. Following the completion of the cut and fill works (described below in Section 4.2.4), the two (2) Natural Feature Blocks will be ecologically restored by planting locally appropriate native trees and shrubs in any areas that currently lack vegetation. The planting locations and specific planting requirements will be confirmed by a detailed Landscaping Plan.

4.2.3 Clarke Drain Minor Tributaries Decommissioning

The Headwaters Drainage Assessment (HDA) (MES 2022) includes classification of the three (3) minor drainage features according to the Toronto and Region Conservation Authority (TRCA) (2014) HDA guidelines. As described in MES (2022), the TRCA (2014) guidelines do not specify any management and/or mitigation requirements for Drainage Feature A and Drainage Feature B. As shown in the Concept Plan, the development of the Site will require the decommissioning of Drainage Feature A and Drainage Feature B. Per the TRCA guidelines, no flow and/or hydrological mitigation requirements have been identified for Drainage Feature A and Drainage Feature B. The proposed decommissioning of Drainage Feature A and Drainage Feature B will require approval from the Rideau Valley Conservation Authority (RVCA) under O.Reg 174/06. No significant impacts to fish habitat are anticipated to occur as a result of the proposed decommissioning of Drainage Feature A and Drainage Feature B (Refer to MES 2022 for additional detail). As such, a review and/or authorization under the Fisheries Act is unlikely to be required to support the decommissioning of the drainage features.

The TRCA (2014) guidelines identify that mitigation measures should be implemented to protect Drainage Feature C from development impacts (Refer to MES 2022 for additional detail). The remnant portion of Drainage Feature C that occurs within the Site is contained entirely within the Natural Feature Block in the northwest corner of the Site. The Natural Feature Block will therefore preserve the remnant portion of Drainage Feature C that occurs within the Site, while also providing a minimum 30 m wide development setback from Drainage Feature C. The purpose of the minimum 30 m wide setback 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 the absorption and filtration of overland stormwater flows. The Natural Feature Block, and the associated minimum 30 m wide setback from Drainage Feature C, are anticipated to be sufficient to mitigate potential development impacts to Drainage Feature C.

4.2.4 Floodplain Cut and Fill

Two (2) Natural Feature Blocks are shown in the Concept Plan. In order to address the presence of the 1:100 year floodplain of the Jock River, the Natural Feature Blocks have been positioned adjacent to the Jock River in the eastern and northwestern parts of the Site. Although the two (2) Natural Feature Blocks contain portions of the 1:100 year floodplain of the Jock River, portions of the floodplain also overlap the proposed development area. As such, a cut and fill operation will be required in order to address areas where the proposed development and the floodplain overlap.

A Cut and Fill Plan is included below. As shown in the Cut and Fill Plan, the proposed cut and fill works will occur entirely within the Site. Fill will be placed within the floodplain where the development area overlaps the floodplain. All areas where fill will be placed are currently cultivated corn fields that are identified for residential development. In order to maintain floodplain storage capacity, a corresponding cut will be undertaken to offset the placement of fill. The areas that will be cut include portions of the Natural Feature Blocks that currently consist of cultivated corn fields. Due to the fact that the cut and fill operation will be undertaken entirely within the development area and areas that are currently cultivated corn fields, the cut and fill operation is unlikely to significantly negatively impact the natural features and functions of the Site. As described above in Section 4.2.2, following the completion of the cut and fill works, the two (2) Natural Feature Blocks will be ecologically restored by planting locally appropriate native trees and shrubs in any areas that currently lack vegetation.

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BACKGROUND TOPOGRAPHY:

AOV SURVEY
(DECEMBER 10, 2020): +92.29

PROPOSED CUT ELEV.: 91.77×

NOTE: 3:1 TERRACING ASSUMED FROM 0.3m ABOVE 100-YEAR REGULATORY FLOOD LINE ELEVATION TO EXISTING GROUND ON CITY OF OTTAWA LANDS.

LEGEND

- 100-YEAR REGULATORY FLOOD LIMIT FROM INTERSECTION OF AOV NOVEMBER 27, 2020 SURVEY AND FLOOD ELEVATIONS REPORTED IN RVCA 2005 JOCK RIVER FLOOD RISK MAP 2.
- 100-YEAR FLOOD LINE FROM RVCA 2005 JOCK RIVER FLOOD RISK MAP 2
- 100-YEAR FLOOD ELEVATIONS REPORTED IN RVCA 2005 JOCK RIVER FLOOD RISK MAP 2.
- PROPERTY LINE

FILL AREA 3
99m²
AVERAGE 100-YEAR REGULATORY
FLOOD ELEVATION = 91.69m

FILL AREA 2
2,563m²
AVERAGE 100-YEAR REGULATORY
FLOOD ELEVATION = 91.70m

FILL AREA 5
2,466m²
AVERAGE 100-YEAR REGULATORY
FLOOD ELEVATION = 91.52m

CUT AREA 2
546m²
AVERAGE 100-YEAR REGULATORY
FLOOD ELEVATION = 91.72m

FILL AREA 6
228m²
AVERAGE 100-YEAR REGULATORY
FLOOD ELEVATION = 91.63m

CUT AREA 7
856m²
AVERAGE 100-YEAR REGULATORY
FLOOD ELEVATION = 91.51m

FILL AREA 1
423m²
AVERAGE 100-YEAR REGULATORY
FLOOD ELEVATION = 91.72m

CUT AREA 1
1,770m²
AVERAGE 100-YEAR REGULATORY
FLOOD ELEVATION = 91.72m

XS: 5002 WSE: 91.71
XS: 5289 WSE: 91.73
XS: 4803 WSE: 91.67
XS: 4534 WSE: 91.61
XS: 4360 WSE: 91.59
XS: 4241 WSE: 91.58
XS: 4042 WSE: 91.56
XS: 3888 WSE: 91.46
XS: 3802 WSE: 91.19
XS: 3699 WSE: 91.08
XS: 3672 WSE: 90.71
XS: 3633 WSE: 90.75
XS: 3589 WSE: 90.62

JOCK RIVER
Flow
100-year FLOOD LINE

CONCESSION 3 (RIDEAU FRONT) (NEPEAN)
REGISTERED PLAN 4M-1585

FILL AREA 1

Elevations Table							
Number	Average Max. Elevation	Average Min. Elevation	Area (m²)	Vol. (m³)	Color	DEPTH BELOW 100-YEAR REGULATORY FLOODPLAIN	
1	91.72	91.62	420.36	7		0.00–0.10	
2	91.62	91.52	0	0		0.10–0.20	
3	91.52	91.42	0	0		0.20–0.30	
4	91.42	91.32	0	0		0.30–0.40	
5	91.32	91.22	0	0		0.40–0.50	
6	91.22	91.12	0	0		0.50–0.60	

FILL AREA 2

Elevations Table							
Number	Average Max. Elevation	Average Min. Elevation	Area (m²)	Vol. (m³)	Color	DEPTH BELOW 100-YEAR REGULATORY FLOODPLAIN	
1	91.70	91.60	1454.92	176		0.00–0.10	
2	91.60	91.50	858.08	57		0.10–0.20	
3	91.50	91.40	195.01	12		0.20–0.30	
4	91.40	91.30	44.80	2		0.30–0.40	
5	91.30	91.20	17.00	0		0.40–0.50	
6	91.20	91.10	0	0		0.50–0.60	

FILL AREA 3

Elevations Table							
Number	Average Max. Elevation	Average Min. Elevation	Area (m²)	Vol. (m³)	Color	DEPTH BELOW 100-YEAR REGULATORY FLOODPLAIN	
1	91.69	91.59	95.27	3		0.00–0.10	
2	91.59	91.49	5.52	0		0.10–0.20	
3	91.49	91.39	0	0		0.20–0.30	
4	91.39	91.29	0	0		0.30–0.40	
5	91.29	91.19	0	0		0.40–0.50	
6	91.19	91.09	0	0		0.50–0.60	

FILL AREA 5

Elevations Table							
Number	Average Max. Elevation	Average Min. Elevation	Area (m²)	Vol. (m³)	Color	DEPTH BELOW 100-YEAR REGULATORY FLOODPLAIN	
1	91.52	91.42	621.40	206		0.00–0.10	
2	91.42	91.32	602.39	142		0.10–0.20	
3	91.32	91.22	490.90	91		0.20–0.30	
4	91.22	91.12	617.41	32		0.30–0.40	
5	91.12	91.02	38.56	1		0.40–0.50	
6	91.02	90.92	2.94	0		0.50–0.60	

FILL AREA 6

Elevations Table							
Number	Average Max. Elevation	Average Min. Elevation	Area (m²)	Vol. (m³)	Color	DEPTH BELOW 100-YEAR REGULATORY FLOODPLAIN	
1	91.63	91.53	178.06	6		0.00–0.10	
2	91.53	91.43	0.49	0		0.10–0.20	

CUT AREA 1

Elevations Table							
Number	Average Max. Elevation	Average Min. Elevation	Area (m²)	Vol. (m³)	Color	DEPTH BELOW 100-YEAR REGULATORY FLOODPLAIN	
1	91.72	91.62	27.69	164		0.00–0.10	
2	91.62	91.52	27.51	162		0.10–0.20	
3	91.52	91.42	1599.59	138		0.20–0.30	

CUT AREA 2

Elevations Table							
Number	Average Max. Elevation	Average Min. Elevation	Area (m²)	Vol. (m³)	Color	DEPTH BELOW 100-YEAR REGULATORY FLOODPLAIN	
1	91.72	91.62	8.71	50		0.00–0.10	
2	91.62	91.52	8.52	50		0.10–0.20	
3	91.52	91.42	495.11	41		0.20–0.30	

CUT AREA 7

Elevations Table							
Number	Average Max. Elevation	Average Min. Elevation	Area (m²)	Vol. (m³)	Color	DEPTH BELOW 100-YEAR REGULATORY FLOODPLAIN	
1	91.51	91.41	43.26	82		0.00–0.10	
2	91.41	91.31	156.08	76		0.10–0.20	
3	91.31	91.21	641.65	20		0.20–0.30	

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MINTO KENNEDY LANDS
FLOODPLAIN CUT -vs- FILL
MINTO PROPERTY

PROJECT No.:	20-1182
SCALE:	1:4000
DATE:	JULY 21, 2021
FIGURE:	3

z:\projects\20-1182_kennedy-lands\b_design\b2_drawings\b2-5_sketches and figures\2021-07-09_cut_fill_updated\2021-08-06_1182_cut-fill_floodplain_ajt_rev_boundary_7m.dwg

4.2.5 Servicing and Stormwater Management

The Concept Plan includes a 0.69 ha Stormwater Management Block. The Stormwater Management Block will accommodate a portion of a new Stormwater Management (SWM) Pond, with the remainder of the SWM Pond located within the adjacent residential subdivision. The new SWM Pond will provide SWM services for the Site. The Site will receive municipal sewer and water.

4.2.6 Sediment and Erosion Controls

As described below in Section 4.4.3, temporary wildlife exclusion fencing (wire re-enforced silt fencing) will be required during the construction phase. The temporary wildlife exclusion fencing will be installed adjacent to the development area along the edges of the two (2) Natural Feature Blocks. In addition to preventing wildlife from entering the development area, this fencing will also serve to mitigate potential sediment and erosion impacts on the Jock River.

During construction, existing conveyance systems along Greenbank Road and in the adjacent subdivisions 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 that 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 new sewer which connects to an existing downstream sewer (e.g. existing sewers along Greenbank 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.

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4.3 Adjacent Lands and Significant Features

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

4.4 Wildlife and Species at Risk

4.4.1 Barn Swallow Regulatory Requirements

Six (6) agricultural structures currently exist within the Site. The six (6) agricultural structures that are found within the Site will be demolished by Minto Communities to accommodate the planned realignment of Greenbank Road through the Site. As described above in Section 3.7.1, Barn Swallow nests are present within Structure #2 and Structure #5. The nests within Structure #2 were confirmed to be active in 2020. Both structures qualify as Barn Swallow habitat. As such, the demolition of Structure #2 and Structure #5 will be subject to the rules and regulations of the Ontario Endangered Species Act (ESA). The removal of structures containing Barn Swallow nests requires the completion of the Ministry of Environment, Conservation, and Parks (MECP) Online Impact Registration Process.

Minto Communities plans to complete the MECP Online Impact Registration Process and the building demolition in late 2022 (pending obtainment of the necessary authorizations). Following the completion of the registration process, the structures can be demolished between September 1st and April 30th. Following the demolition of the structures, Minto Communities will provide habitat compensation by installing two (2) Barn Swallow nesting gazebos. The rules and regulations of the Ontario ESA require the Barn Swallow nesting gazebos to be constructed within 1 km of the Site. Minto Communities plans to install the nesting gazebos within the Natural Feature Block in the northwest corner of the Site. Following the construction of the nesting gazebos, Minto Communities will be required to monitor and maintain the nesting gazebos for a three (3) year period (tentatively from 2023 to 2025).

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4.4.2 Bird Safe Design Guidelines

As described above in Section 3.6, the Site is located in close proximity to the Jock River, which is likely to function as a bird migration corridor. The buildings that will be constructed as part of the future development may therefore pose an increased risk of bird collision. Portions of the future development will interface with the two (2) Natural Feature Blocks. Future buildings located adjacent to the Natural Feature Blocks may also pose an increased risk of bird collision (City of Ottawa 2020). The City of Ottawa *Bird Safe Design Guidelines* identify mitigation measures which can be implemented to reduce the risk of bird collision. Where feasible and compatible with the development requirements, the following guidelines should be considered during the development of the architectural/building designs and the Landscaping Plan (as applicable) (City of Ottawa 2020). Guidelines which are not relevant to the proposed development (e.g. guidelines that do not apply to single detached homes and/or townhomes) have been omitted from the list below:

- Minimize the transparency and reflectivity of glazing (Refer to Guideline #2). Note that Guideline #2 is considered the highest priority to reduce the risk of bird collision;
    - Avoid monolithic, undistinguished expanses of glazing;
    - Incorporate visual interest or differentiation of material, texture, color, opacity, or other features to fragment reflections; and
    - Where glazing is used, bird-safe glass or glass with integrated protection measures is preferred. Refer to Guideline #2 for treatment directions.
- Avoid or mitigate design traps (Refer to Guideline #3);
    - All glazing that could create a fly-through, mirror maze or black hole effect should be made bird-safe, using bird-safe glass or integrated protection measures as described in Guideline #2;
    - Glass corners should be treated to render them bird-safe for 5 meters in each direction; and
    - Glass railings, parapets, and similar clear barriers should use bird-safe glass as specified in Guideline #2.
- Consider the impact of other structural features (e.g. antennas, wires, poles, etc.) (Refer to Guideline #4);
    - Grates should have a maximum porosity of 20 mm by 20 mm or 40 mm by 10 mm, or should be screened to prevent birds from falling through; and
    - Ensure that vertical pipes, flues and vents are capped or screened to prevent wildlife entry.
- Design bird safe landscaping (Refer to Guideline #5);
    - Design landscape plantings to minimize reflections of trees and shrubs in nearby buildings. In cases where landscape planting near a glazed building façade or other reflective surface is desirable for shading or other purposes, Guideline #2 must be applied to obscure habitat reflections;

  - Avoid or minimize the number of linear landscape features leading directly into glass façades or doors. Where such features cannot be avoided, Guideline #2 must be applied;
  - Avoid using plant species known to attract birds (e.g., those with abundant fruit or seed crops, or with flowers attractive to hummingbirds) in locations that could result in harmful collisions;
  - Minimize the exterior visibility of any indoor vegetation, green walls or water features to reduce their attractiveness to birds; and
  - Avoid locating ornamental fountains, ponds, stormwater retention basins, wetlands, swales or related infrastructure near glass façades or windows.
- Design exterior lighting to minimize light trespass at night (Refer to Guideline #6);
  - Avoid up-lighting;
  - Specify Dark Sky compliant, full-cutoff exterior fixtures to reduce light trespass;
  - Use motion detectors and other automatic lighting controls to reduce or extinguish non-essential lighting between 11 pm and 6 am;
  - Use minimum wattage fixtures to achieve appropriate lighting levels (note: minimum required lighting levels are established in the Ontario Building Code);
  - Minimize amount and visual impact of perimeter lighting; and
  - Avoid use of floodlighting.
- Avoid night time light trespass from the building's interior (Refer to Guideline #7);
  - Use window shades or blinds to prevent light trespass from occupied spaces between sunset and sunrise.

The potential application of the guidelines listed above will require consideration by the applicable Qualified Professionals (e.g. Architect, Landscape Architect, etc.) as they develop the architectural/building designs and the Landscaping Plan. Refer to the City of Ottawa *Bird Safe Design Guidelines* for additional details (City of Ottawa 2020).

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4.4.3 Species at Risk and Wildlife Construction Stage Mitigation

The mitigation requirements for Species at Risk (SAR) and wildlife during construction are summarized here. These recommendations include provisions from the City of Ottawa (2015) *Protocol for Wildlife Protection During Construction*, as well as requirements specific to Barn Swallows:

- **Pre-Stressing:** Prior to vegetation removal, the area will 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 will be cleared towards the Natural Feature Blocks, in order to provide an opportunity for wildlife to leave the area;
- **Temporary Exclusion Fencing:** Temporary wildlife exclusion fencing (wire re-enforced silt fencing) will be required during the construction phase. The temporary wildlife exclusion fencing will be installed adjacent to the development area along the edges of the two (2) Natural Feature Blocks. The temporary wildlife exclusion fencing will mitigate the risk that wildlife may travel from the Jock River to enter the Site;
- **Sweeps:** Prior to vegetation clearing, preconstruction sweeps of vegetated areas will be undertaken to ensure wildlife are not present. A designated staff member will be required to conduct daily sweeps each morning prior to the commencement of work to ensure that wildlife have not entered the work area. The designated staff member will also periodically inspect the temporary exclusion fencing to ensure there are no gaps or holes in the fence;
- **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 stop safely to avoid wildlife;
- **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 highwater 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 will 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 will be kept on Site any time development activities are taking place;
- **Species at Risk (SAR) Encounters:** If a Species at Risk (SAR) is encountered in the work area, construction in the vicinity must be stopped immediately and measures must be taken to ensure the SAR is not harmed. The project biologist and the Ministry of Environment, Conservation, and Parks (MECP) must be contacted to discuss how to proceed prior to the 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 rules and regulations of the Ontario Endangered Species Act (ESA) require the demolition of buildings that provide Barn Swallow habitat to occur between September 1st and April 30th; and
  - The core migratory bird nesting season is defined as April 15th to August 15th each year. In order to avoid impacting the nests of migratory birds, initial tree clearing must be undertaken between August 15th 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. As described above, the development of the Site is not anticipated to contribute significantly to the cumulative loss of forest and/or wetland habitat. The Ontario Endangered Species Act (ESA) process requires that proponents either mitigate all impacts to a species, or that they provide a benefit to the species, both of which imply no net loss of habitat functionality. The loss of Barn Swallow habitat will be addressed as required by the rules and regulations of the Ontario ESA (Refer to Section 4.4.1 for additional detail).

6.0 MONITORING

Construction stage monitoring requirements are outlined in Section 4.4.3 (above). Construction stage monitoring will include pre-construction sweeps to inspect fencing and vegetation prior to tree clearing, as well as daily sweeps by construction staff. As described above in Section 4.4.1, the rules and regulations of the Ontario Endangered Species Act (ESA) require the Barn Swallow habitat compensation project to be maintained and monitored for a three (3) year period (tentatively from 2023 to 2025).

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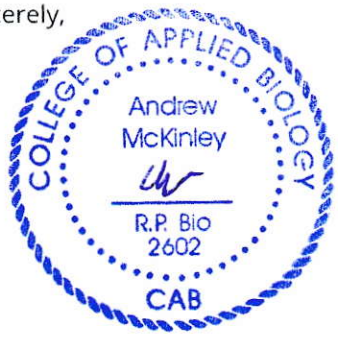
7.0 CLOSURE

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

Plant List

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TABLE A: PLANT LIST

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
Brome Grass	Bromus sp.		n/a	Grass
Timothy	Phleum pratense	SNA	Common	Grass
Meadow Grass sp.	Poa sp.		Common	Grass
Common Ragweed	Ambrosia artemisiifolia	S5	Common	Herbaceous
Canada Anemone	Anemone canadensis	S5	Common	Herbaceous
Common Burdock	Arctium minus	SNA	Common	Herbaceous
Common Milkweed	Asclepias syriaca	S5	Common	Herbaceous
Yellow Rocket	Barbarea vulgaris	SNA	Common	Herbaceous
Chickory	Cichorium intybus	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
Common Strawberry	Fragaria virginiana	S5	Common	Herbaceous
Ox-eye Daisy	Leucanthemum vulgare	SNA	Common	Herbaceous
Bird's-foot Trefoil	Lotus corniculatus	SNA	Common	Herbaceous
White Sweet Clover	Melilotus albus	SNA	Common	Herbaceous
Wild Parsnip	Pastinaca sativa	SNA	Common	Herbaceous
Common Plantain	Plantago major	S5	Common	Herbaceous
Common Buttercup	Ranunculus acris	SNA	Common	Herbaceous
Canada Goldenrod	Solidago canadensis	S5	Common	Herbaceous
Sow Thistle	Sonchus arvensis	SNA	Common	Herbaceous
New England Aster	Symphyotrichum novae-angliae	S5	Common	Herbaceous
Dandelion	Taraxacum officinale	SNA	Common	Herbaceous
Red Clover	Trifolium pratense	SNA	Common	Herbaceous
White Clover	Trifolium repens	SNA	Common	Herbaceous
Common Stinging Nettle	Urtica dioica	SNA	Common	Herbaceous
Common Mullein	Verbascum thapsus	SNA	Common	Herbaceous

Common Speedwell	Veronica officinalis	SNA	Common	Herbaceous
Tufted Vetch	Vicia Cracca	SNA	Common	Herbaceous
Red Osier Dogwood	Cornus sericea (stolonifesa)	S5	Common	Shrub
Hawthorn	Crataegus chrysocarpa	S5	Common	Shrub
Tartarian Honeysuckle	Lonicera tatarica	SNA	Common (aggressive invasive)	Shrub
Common Buckthorn	Rhamnus cathartica	SNA	Common (aggressive invasive)	Shrub
Wild Red Raspberry	Rubus idaeus	S5	Common	Shrub
Lilac	Syringa vulgaris	SNA	Common	Shrub
Manitoba Maple	Acer negundo	S5	Common	Tree
Silver Maple	Acer saccharinum	S5	Common	Tree
Sugar Maple	Acer saccharum	S5	Common	Tree
White Ash	Fraxinus americana	S5	Common	Tree
Black Walnut	Juglans nigra	S4	Rare	Tree
Domestic Apple	Malus sylvestris	n/a	Common	Tree
White Spruce	Picea glauca	S5	Common	Tree
Trembling Aspen	Populus tremuloides	S5	Common	Tree
Bur Oak	Quercus macrocarpa	S5	Common	Tree
Staghorn Sumac	Rhus hirta	S5	Common	Tree
White Cedar	Thuja occidentalis	S5	Common	Tree
American Basswood	Tilia americana	S5	Common	Tree
American or White Elm	Ulmus americana	S5	Common	Tree
Virginia Creeper	Parthenocissus vitacea	S5	Common	Vine
Riverbank Grape	Vitis riparia	S5	Common	Vine

Provincial Ranks (assigned by NHIC)

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

APPENDIX B

Bird and Wildlife Lists

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TABLE B: BIRD LIST	
Common Name	**Scientific Name**
Red Winged Blackbird	Agelaius phoeniceus
Mallard	Anas fulvigula
Canada Goose	Branta canadensis
Northern Cardinal	Cardinalis cardinalis
Turkey Vulture	Cathartes aura
Killdeer	Charadrius vociferus
Northern Flicker	Colaptes auratus
American Crow	Corvus brachyrhynchos
Blue Jay	Cyanocitta cristata
Gray Catbird	Dumetella carolinensis
Alder Flycatcher	Empidonax alnorum
American Kestrel	Falco sparverius
Barn Swallow - Threatened	***Hirundo rustica***
Baltimore Oriole	Icterus galbula
Dark Eyed Junco	Junco hyemalis
Ring Billed Gull	Larus delawarensis
Song Sparrow	Melospiza melodia
House Sparrow	Passer domesticus
Savannah Sparrow	Passerculus sandwichensis
Black Capped Chickadee	Poecile atricapilla
Common Grackle	Quiscalus quiscula
Eastern Phoebe	Sayornis phoebe
American Goldfinch	Spinus tristis
Chipping Sparrow	Spizella passerina
European Starling	Sturnus vulgaris
Tree Swallow	Tachycineta bicolor
Brown Thrasher	Toxostoma rufum

American Robin	Turdus migratorius
Eastern Kingbird	Tyrannus tyrannus
Mourning Dove	Zenaida macroura

TABLE C: WILDLIFE LIST	
Common Name	**Scientific Name**
Eastern Grey Squirrel	Sciurus carolinensis
Red Squirrel	Sciurus vulgaris
Eastern Cottontail	Sylvilagus floridanus
Eastern Chipmunk	Tamias striatus
American Toad	Anaxyrus americanus
Northern Leopard Frog	Lithobates pipiens

APPENDIX C

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

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NEPEAN	NORTH CROSBY	NORTH GOWER
American Eel	American Eel	Bald Eagle
Bald Eagle	Bald Eagle	Bank Swallow
Bank Swallow	Bank Swallow	Barn Swallow
Barn Owl	Barn Swallow	Blanding's Turtle
Barn Swallow	Black Tern	Bobolink
Black Tern	Blanding's Turtle	Bridle Shiner
Blanding's Turtle	Blunt-lobed Woodsia	Butternut
Bobolink	Bobolink	Chimney Swift
Butternut	Bridle Shiner	Eastern Meadowlark
Chimney Swift	Butternut	Eastern Musk Turtle
Eastern Meadowlark	Cerulean Warbler	Eastern Small-footed Myotis
Eastern Small-footed Myotis	Chimney Swift	Eastern Wood-pewee
Eastern Whip-poor-will	Eastern Meadowlark	Evening Grosbeak
Eastern Wood-pewee	Eastern Musk Turtle	Gypsy Cuckoo Bumble Bee
Evening Grosbeak	Eastern Ribbonsnake	Henslow's Sparrow
Gypsy Cuckoo Bumble Bee	Eastern Small-footed Myotis	Least Bittern
Hickorynut	Eastern Wood-pewee	Little Brown Myotis
Horned Grebe	Golden-winged Warbler	Loggerhead Shrike
Lake Sturgeon	Gray Ratsnake	Monarch
Least Bittern	King Rail	Northern Map Turtle
Little Brown Myotis	Least Bittern	Northern Myotis
Loggerhead Shrike	Little Brown Myotis	Peregrine Falcon
Monarch	Loggerhead Shrike	Red-headed Woodpecker
Northern Map Turtle	Monarch	Rusty Blackbird
Northern Myotis	Northern Map Turtle	Rusty-patched Bumble Bee
Peregrine Falcon	Northern Myotis	Short-eared Owl
Piping Plover	Olive-sided Flycatcher	Snapping Turtle
Red Knot *rufa* subspecies	Red-headed Woodpecker	Tri-colored Bat
Red-necked Phalarope	Snapping Turtle	Wood Thrush
River Redhorse	Tri-colored Bat	Yellow-banded Bumblebee
Rusty Blackbird	Wood Thrush	
Rusty-patched Bumble Bee	Yellow Rail	
Silver Lamprey		
Snapping Turtle		
Transverse Lady Beetle		
Tri-colored Bat		
Wood Thrush		
Yellow-banded Bumblebee		