

# **Environmental Impact Statement and Tree Conservation Report – Mattamy Richmond**

**Updated Report**

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## 1.0 INTRODUCTION

This report is an updated Environmental Impact Statement (EIS) and Tree Conservation Report (TCR) in support of the Plan of Subdivision and Zoning applications for a mixed-residential development within the Village of Richmond. It is based on the previous EIS for the proposed community produced 2013 (i.e. Kilgour 2013), but it updates the community plan, addresses new species at risk that have been listed since the last report, and provides details related to changes in site tree cover (primarily associated with the loss of ash species due to Emerald Ash Borer – EAB). The proposed development area has maintained as a fully active agricultural lands since the previous report, but has not otherwise changed (apart from the loss of ash trees).

### 1.1 Planning and Policy Context

The development site includes the properties of 6431 Ottawa St. (PLAN D25 PT UNITS 9 AND 10; RP 4R23166 PARTS 2 TO 7) and 6420 Ottawa St. (PLAN 4D23 UNIT 24 PT UNIT 19; AND RP 4R22281 PART 1). The site covers 78.7 ha of land north of the Jock River and spanning Ottawa St. in the south west corner of Richmond. The land is currently owned by Mattamy Homes.

The site (Figure 1) is located mostly within a Development Reserve described as DR1 (consolidation date June 25, 2008) in the City of Ottawa Official Plan. The north east corner of the site is zoned V1C[614r]-h. The south end of the property includes area adjacent to the Jock River and identified as part of the Jock River Corridor within Ottawa's Natural Heritage System and within natural areas identified by the Greenspace Master Plan. The western portion of this corridor area includes a forested area consistent with the City of Ottawa's definition of a Significant Woodland (Section 2.4.2 of the Official Plan) and is identified as such as NESS Area 422, a part of the Marlborough Forest. Finally, two species at risk have been directly observed on the property near the Jock River, (Butternut - *Juglans cinerea* and Bobolink - *Dolichonyx oryzivorus*). These three features provide the "trigger" for a full EIS.

This report documents natural environment information based on existing public data and multiple field studies conducted between 2008 and 2012, with a brief review of site trees in and general habitat potential in 2017. The goal of this report is to identify potential impacts, and mitigations to those impacts, of the proposed development adjacent to natural features within the Jock River natural corridor, including a portion of the Marlborough Forest, and to species at risk occurring within this area.

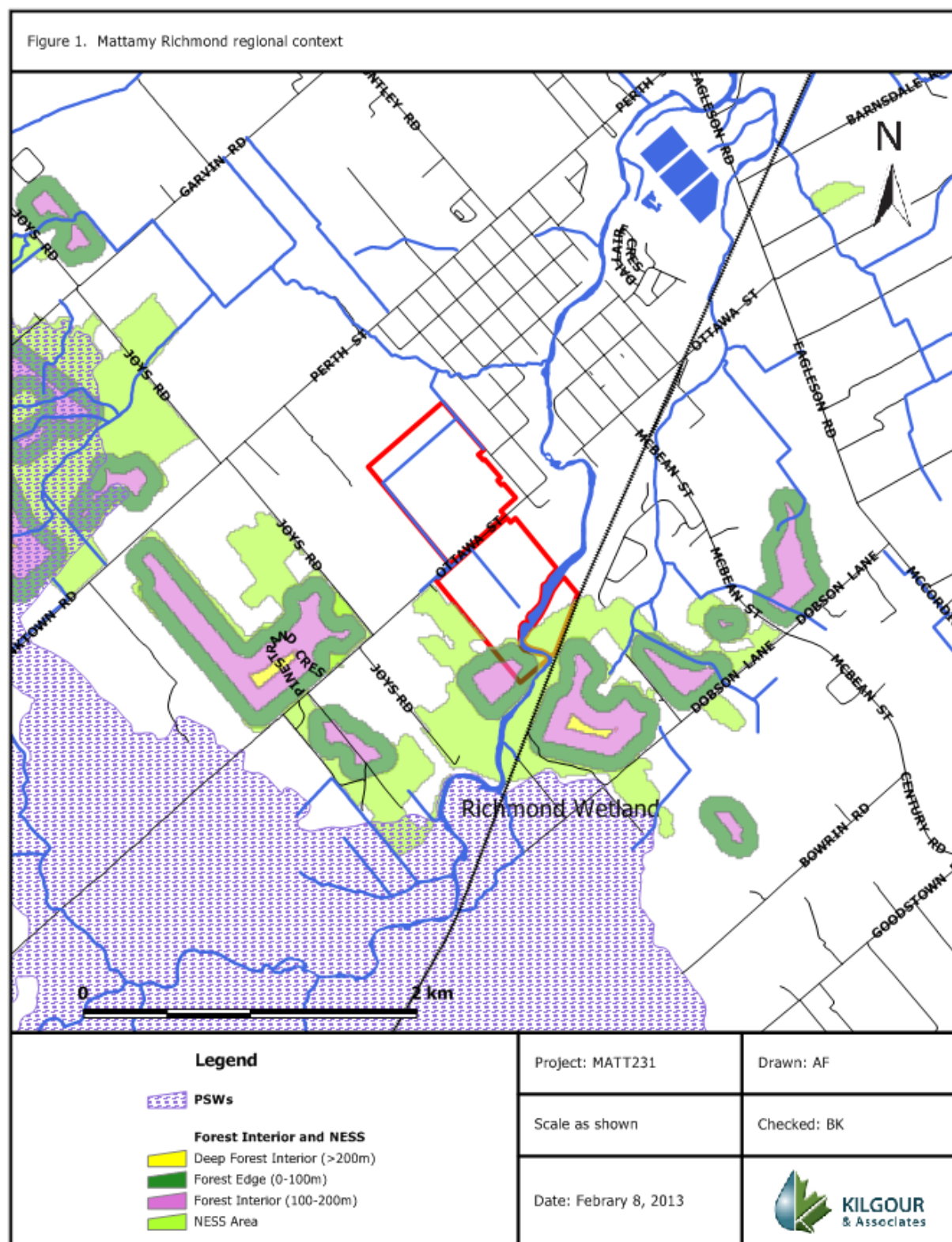


Figure 1. Mattamy Richmond regional context

## **2.0 DESCRIPTION OF THE SITE AND THE NATURAL ENVIRONMENT**

### **2.1 Soils and Topography**

The surficial geology of the site shows predominantly fine, offshore sediments of the Champlain Sea: clay, silty clay and silt. Two small areas of till plain are located on the east and west sides of site at Ottawa Street. Near the Jock River, the older bedrock is more exposed in outcrops of limestone, dolomite, and/or sandstone. Soil mapping shows the entire property to be slightly alkaline to neutral, poorly drained clay loam (North Gower Clay Loam) and loam (Osgoode Loam). The site has generally level topography. Bottomland soils are found along the Jock River floodplain (KAL, Parish & Mattamy, 2010).

### **2.2 Land Cover**

Land cover information is based in part on descriptions within the *Natural Environment & Impact Assessment Study* (herein NEIA - KAL, Parish & Mattamy 2010) for the Western Development Lands (WDL), with minor updates for individual trees (some as per the KAL [2013] EIS and some from a site visit by KAL biologist Terry Hams on December 19, 2017). As such, labeling of vegetation communities and other natural features follows conventions established within that report. The Mattamy property is primarily an active agricultural area (Figure 2). The areas north of Ottawa St. consist of tilled land with crops divided into discrete sections by two dense hedgerows (H3 and H4) and a fence line with scattered trees. Hedgerows H5 and H6 run along the western and eastern side of the property respectively north of Ottawa St. A small woodlot (Community 2, 0.7 ha) is located on the eastern side of the property, a larger woodlot (W3, 5.8 ha) is adjacent to the western boundary.

Farmland covers approximately two thirds of the area south of Ottawa St, with cropped areas extending well into the Jock River floodplain. While these southern fields were left fallow one year in 2011, they have historically been regularly plowed and cropped, and have been actively managed for agriculture every year since 2012, generally with soybeans. The remainder of the site along the Jock River consists of a roughly triangular area of natural land covers including fields, marshes, forests and swamps. This natural area forms part of the Jock River riparian corridor leading into the much larger Marlborough Forest and Richmond Fen natural area complex, and is thereby a component of the Natural Heritage System. Forested areas in south west corner of the property are classed as NESS 422. All of these characteristics and functions support the designation of significant woodlands and significant wildlife habitat within the context of the PPS and the City's Official Plan (OPA 76). Specific land covers are detailed below.

#### **Community 2: Fresh- Moist Ash Lowland Deciduous Forest (FOD 7-2)**

This 0.9 ha woodland is just north of Ottawa St. with several homes on Queen Charlotte St backing onto it; it is located just outside of the Mattamy development area. It is small and open enough that the backyards are visible from on the opposite side. Three sides of the woodland are surrounded by active farm fields.

The woodland is a fresh-moist lowland deciduous forest community. The dominant species in the overstorey were Green Ash, though all the ash trees here now show signs of impact from Emerald Ash

Borer (EAB), but there were also some White Elm, Bur Oak (mostly along the edges), Eastern White Cedar (a few in the northeast corner), and Trembling Aspen. The woodland contained 12 trees over 50 cm dbh, mostly Green Ash and Bur Oaks. This observation matched a comment from the City of Ottawa that the woodland appeared on aerial photos from the 1940s. The shrub layer and understory of the woodland was grown up in Manitoba Maple (*Acer negundo*\*). Additional shrub layer species included Prickly Gooseberry (*Ribes cynosbati*), and Canada Blackberry (*Rubus canadensis*), with some European Buckthorn (*Rhamnus cathartica*\*) seedlings and small shrubs apparent.

Ground layer plants in the woodland included: Virginia Creeper (*Parthenocissus inserta*), Lopseed (*Phryma leptostachya*), Spinulose Woodfern (*Dryopteris carthusiana*), Ebony sedge (*Carex eburnea*), Canada Wood-nettle (*Laportea canadensis*), Panicked Aster (*Symphyotrichum lanceolatum*), Frost Grape (*Vitis riparia*), Bur cucumber (*Echinocystis lobata*), Enchanter's Nightshade (*Circaea lutetiana*), Sensitive fern (*Onoclea sensibilis*), Virginia waterleaf, Fowl Manna-grass (*Glyceria striata*), Motherwort (*Leonurus cardiaca*\*), Poison Ivy (*Rhus radicans*), Nightshade (*Solanum dulcamara*\*), Wild strawberry (*Fragaria virginiana*), Helleborine (*Epipactis helleborine*\*), Lady fern (*Athyrium filix-femina*), Calico Aster (*Symphyotrichum lateriflorus*), Sedges (*Carex* spp.), Avens (*Geum* sp.), Willow-herb (*Epilobium* sp.), and Violets (*Viola* sp.). From the mosses at the base of the trees, it looks as though this woodland may be quite wet during the early spring snowmelt.

Towards the southern edge of the woodland, the trees were younger (almost exclusively Manitoba Maple with some Balsam poplar, and a Hawthorn (*Crataegus* sp.). In the more open areas there were field species such as Red raspberry (*Rubus idaeus*), Wild parsnip (*Pastinaca sativa*\*), Staghorn sumac (*Rhus typhina*), White Sweet Clover (*Melilotus alba*\*), Yellow Goatsbeard (*Tragopogon pratensis*\*), Canada Goldenrod (*Solidago canadensis*), Burdock (*Arctium minus*\*), and Tall Goldenrod (*Solidago altissima*). At the southernmost edge, the woodland graded into a dense, young thicket of Ash and Manitoba Maple, with Stinging Nettle (*Urtica dioica*\*) in the understory.

This area had been used for many years as a dumpsite for garbage from the agricultural field and the residential development, with old furniture, sheet metal, rolls of wire, carpets, buckets, and yard waste observed. One effect of this dumping was the dominance of an unidentified garden escape, which was common in the groundcover throughout the woodland. There were some informal footpaths through the woodland, and the southwest corner appeared to have an old foundation in it, and a small paved area, with trees now growing up through it.

This woodland feature does not meet the criteria necessary to be classified a significant woodland. The largest trees within this community are described separately within the Section 2.3 below.

#### **Community 4: Forb Mineral Meadow Marsh (MAM 2-10)**

A meadow marsh is an area which floods seasonally, where the standing water depth is less than 2 m, and which often becomes moist or even dry by mid-summer. A large (0.78 ha) area along the northern shoreline of the Jock River consists of meadow marsh dominated by a variety of forb (herbaceous plant) species. The dominant forbs here are Spotted Joe Pye-weed (*Eupatorium maculatum*), Jewelweed (*Impatiens capensis*), Tall Meadow-rue (*Thalictrum pubescens*), Purple Loosestrife (*Lythrum salicaria*), and

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\* Denotes non-native species

Stinging Nettle (*Urtica dioica* spp. *gracilis*). Graminoids include a large patch of Sweet-flag (*Acorus americanus*), as well as Reed Canary Grass (*Phalaris arundinacea*) and Canada Bluejoint (*Calamagrostis canadensis*). Shrubs such as Slender Willow (*Salix petiolaris*), Meadowsweet (*Spiraea alba* var. *alba*), Gray Dogwood (*Cornus racemosa*) and Red-osier Dogwood (*Cornus stolonifera*) are also present in smaller patches throughout the community. The regionally significant Beaked Sedge (*Carex utriculata*) was found in this community.

A lightly used walking path runs through this community and small (<0.5 ha) patches can be found where the vegetation shows characteristics of drier soils, where old-field species such as Timothy (*Phleum pratense*), Cow Vetch (*Vicia cracca*) and Milkweed (*Asclepias syriaca*) dominate.

#### **Community 5: Reed Canary-grass Mineral Meadow Marsh (MAM 2-2)**

This community runs along the northern shoreline of the Jock River. It is dominated by Reed-canary Grass (*Phalaris arundinacea*), a wetland grass. The soils are mainly mineral soils, with some organic soils right along the Jock River where flooding is more frequent. Forbs (herbaceous plants) are widespread throughout most of this community. Other common species here are Spotted Joe Pye-weed (*Eupatorium maculatum*), Jewelweed (*Impatiens capensis*), Tall Meadow-rue (*Thalictrum pubescens*), Stinging Nettle (*Urtica dioica* spp. *gracilis*), Meadowsweet (*Spiraea alba* var. *alba*), and Canada Bluejoint (*Calamagrostis canadensis*). There is no visible human disturbance in this community. The regionally significant Beaked Sedge (*Carex utriculata*) was collected from this community.

#### **Community 6: Pickerelweed Mixed Shallow Aquatic Vegetation Type (SAM 1-1)**

Shallow aquatic vegetation communities occur in areas where the water depth is up to 2 m, and there is standing water present throughout the year. Along the northern shore of the Jock River is shallow aquatic vegetation with a mixture of both submerged and floating plants. It is dominated by Pickerelweed (*Pontederia cordata*). Other floating and emergent plants are Bur-reed (*Sparganium eurycarpum*), Arrowhead (*Sagittaria latifolia*), Spikerush (*Eleocharis* sp.) and Soft-stem Bulrush (*Scirpus validus*). Common floating plants include Yellow Pond-lily (*Nuphar variegatum*), European Frog's-bit (*Hydrocharis morsus-ranae*), Lesser Duckweed (*Lemna minor*) and the regionally significant Greater Duckweed (*Spirodela polyrrhiza*). Common submerged plants are Coontail (*Ceratophyllum demersum*) and Common Waterweed (*Elodea canadensis*). There is little or no human disturbance in this community, although the aggressive invasive European Frog's-bit is dominant in places.

#### **Community 7: Willow Mineral Thicket Swamp (SWT 2-2)**

This thicket swamp stretches along the edge of the recently constructed berm at the south end of the agricultural fields. This area is a low depression, with standing water (>0.5 m) in several locations, even in late June 2008. It is dominated by large stands of shrubby Slender Willow (*Salix petiolaris*) but also contains Gray Dogwood (*Cornus racemosa*), Meadowsweet (*Spiraea alba* var. *alba*) and saplings of White Elm (*Ulmus americana*). Widespread herbaceous species include: Canada Bluejoint (*Calamagrostis canadensis*), Bur-reed (*Sparganium eurycarpum*), Fowl Manna Grass (*Glyceria striata*), Reed Canary-grass (*Phalaris arundinacea*), Arrowhead (*Sagittaria latifolia*), Water Parsnip (*Sium suave*), and Bulb-bearing Water Hemlock (*Cicuta bulbifera*). This community has upland species at its northern edge.



### **Community 8: Fresh- Moist Ash Lowland Deciduous Forest (FOD 7-2)**

This area of deciduous forest lies in moist floodplain mineral soils. The dominant species present are Green Ash (*Fraxinus pennsylvanica*) with some Black Ash (*Fraxinus nigra*), White Cedar (*Thuja occidentalis*) White Elm (*Ulmus americana*) and Manitoba Maple (*Acer negundo*). The understory is similar to that in Community 12, and shows some signs of seasonal disturbance due to flooding (e.g., waterlines and scattered debris). There are signs of beaver activity (e.g., chewed stumps).

### **Community 9: Dry-Moist Old Field (CUM 1-1)**

Along the Jock River, this old field appears to be used for recreational activities (e.g., river access for swimming, camping). Several trails converge here, and there is a large firepit and some minor dumping of garbage. The bank to a small limestone ledge along Jock River is fairly steep (~1.5 m) and the water is fast-moving with little vegetation. Non-native species dominate in this old field, including White Sweet Clover (*Melilotus alba*), Smooth Brome (*Bromus inermis*), Cow Parsnip (*Pastinaca sativa*), Timothy grass (*Phleum pratense*), Cow Vetch (*Vicia cracca*), Tall buttercup (*Ranunculus acris*), Red clover (*Trifolium pratense*) and Ox-eye Daisy (*Chrysanthemum leucanthemum*). Native species include Common Milkweed (*Asclepias syriaca*), Goldenrod (*Solidago* sp.), Philadelphia Fleabane (*Erigeron philadelphicus*) and a small patch of Fox-glove Beardtongue (*Penstemon digitalis*).

### **Community 10: Mineral Cultural Woodland (CUW 1)**

A “cultural woodland” is a community that results from past human disturbance, such as clearing. This semi-wooded area contains relatively open (35 to 65%) tree cover, mainly of Eastern White Cedar (*Thuja occidentalis*), which occurs in patches. However, many of these patches consist of dense cedars, many of them mature. The understorey in these patches is very sparse or absent, but may include Poison Ivy (*Toxicodendron radicans*), Common Speedwell (*Veronica officinalis*) and Enchanter’s Nightshade (*Circaea quadrifida*). In the openings between cedar patches, there are species common in old fields: Timothy (*Phleum pratense*), Smooth Brome (*Bromus inermis*), Wild Basil (*Clinopodium vulgare*), Wild Marjoram (*Origanum vulgare*), Goldenrod (*Solidago* sp.), Meadowsweet (*Spiraea alba* var. *alba*), Staghorn Sumac (*Rhus typhina*), Ox-eye Daisy (*Chrysanthemum leucanthemum*), Graceful Sedge (*Carex gracillima*), Pale Sedge (*Carex pallescens*), and Compressed Sedge (*Carex arctata*). A large number of young White Cedar saplings suggests that this area will fill in with White Cedar over time. There is a trail that passes through clearings to the river.

This community is not part of the NESS Area but does provide a buffer space between the Marlborough Forest area (Communities 9, 11, 12 and 13), and the active agricultural areas to the north.

### **Community 11: Fresh-Moist White Cedar Coniferous Forest (FOC 4-1)**

A band of mature White Cedar forest extends through the western part of the study area. Although large Eastern White Cedar trees (*Thuja occidentalis*) make up the predominant overstorey species, other mature tree species, mainly deciduous, are present throughout the community. These include Sugar Maple (*Acer saccharum*), Basswood (*Tilia americana*), Balsam Poplar (*Populus balsamifera*) and White Elm (*Ulmus americana*). Common in the shrub layer, which in places is quite sparse, are saplings of Red Maple

(*Acer rubrum*), Sugar Maple (*Acer saccharum*), Beaked Hazel (*Corylus cornuta*), Red Elderberry (*Sambucus pubens*) and European Buckthorn (*Rhamnus cathartica*). The ground flora is varied and characteristic of rich soils. Typical of the many herbaceous species in this large area are Stellate Sedge (*Carex radiata*), Blue Cohosh (*Caulophyllum thalictroides*), Enchanter's Nightshade (*Circaea quadrisulcata*), Oak Fern (*Gymnocarpium dryopteris*), and Spinulose Woodfern (*Dryopteris carthusiana*).

A lightly used trail network passes through much of this community, causing very little disturbance. At the northern end of the community (nearest the fields), there is a small dump site with an old car and other garbage. Overall, there are few non-native invasive species in this community. The invasive species of greatest concern is European Buckthorn (*Rhamnus cathartica*), but it remains at relatively low levels at this time. One provincially endangered Butternut tree (*Juglans cinerea*) occurs within this community.

#### **Community 12: Fresh-Moist Sugar Maple – Lowland Ash Deciduous Forest (FOD 6-1)**

Along the southwestern boundary of the Mattamy lands, there is a large patch of moist deciduous forest on floodplain soils. Throughout most of this area, Sugar Maple (*Acer saccharum*) is the dominant overstorey species. However, smaller low-lying areas, for example at least two areas with permanent woodland pools, throughout the community are dominated by large Black Ash (*Fraxinus nigra*) trees. Other common overstorey species are Basswood (*Tilia americana*) and White Elm (*Ulmus americana*). This is a mature forest, with many Sugar Maple trees throughout the area exceeding 18 inches DBH (Diameter at Breast Height). In the forest understorey were many saplings, including Hop Hornbeam (*Ostrya virginiana*), Basswood (*Tilia americana*), Bur Oak (*Quercus macrocarpa*), Bitternut Hickory (*Carya ovata*), young Sugar Maple (*Acer saccharum*) and Ash (*Fraxinus* sp.), as well as shrubs such as Alternate-leaved Dogwood (*Cornus alternifolia*), Beaked Hazel (*Corylus cornuta*), and Red Elderberry (*Sambucus pubens*). Common ground flora were Peduncled Sedge (*Carex pedunculata*), Stellate Sedge (*Carex radiata*), Blue Cohosh (*Caulophyllum thalictroides*), Jack-in-the-Pulpit (*Arisaema triphylla*), Enchanter's Nightshade (*Circaea quadrisulcata*), Toothwort (*Cardamine diphylla*), and White Trillium (*Trillium grandiflorum*). However, wetter areas with permanent woodland pools were dominated by wetland vegetation such as Sensitive Fern (*Onoclea sensibilis*), Ostrich Fern (*Matteucia struthiopteris*), Jewelweed (*Impatiens capensis*), Hop Sedge (*Carex lupulina*), and Bladder Sedge (*Carex intumescens*).

There is almost no human disturbance in this community. Part of the trail network extends along the western property boundary but is very lightly used. There has been some use by mountain bikes in the past, but paths and structures do not appear to have been used recently. There were very few invasive species observed within this community, and none are aggressive invaders. Songs of forest interior breeding birds such as Ovenbirds, Wood Thrushes, and Veerys were heard throughout this community, confirming that it does provide forest interior habitat for these sensitive species.

#### **Community 13: Fresh- Moist Ash Lowland Deciduous Forest (FOD 7-2)**

A second area of low deciduous forest dominated by ash occurs along the northern shoreline of the Jock River. The main species here are Green Ash (*Fraxinus pensylvanica*) with some White Elm (*Ulmus americana*), and Black Ash (*Fraxinus nigra*). Common species in the sometimes-dense understorey are Enchanter's Nightshade (*Circaea quadrisulcata*), White avens (*Geum canadense*), Stellate Sedge (*Carex*

*radiata*), and Virginia creeper (*Parthenocissus inserta*). One provincially endangered Butternut tree (*Juglans cinerea*) occurs within this community.

#### **Community 14: Mineral Thicket Swamp (SWT2)**

This young wetland area on mineral soils (sandy clay) is in the intermediate stages of regeneration, likely from being used as pasture. It is identified only to the broader ecosite type because its dominants are mixed throughout the community. Slender Willow (*Salix petiolaris*) and Bebb's Willow (*Salix bebbiana*) are found almost throughout, but other dominants include young saplings (<5 m in height, and often >25% cover) of Green Ash (*Fraxinus pennsylvanica*), Silver Maple (*Acer saccharinum*), White Elm (*Ulmus americanus*), Balsam Poplar (*Populus balsamifera*) and Trembling Aspen (*Populus tremuloides*). Typical shrubs in this community include Speckled Alder (*Alnus rugosa*), Silky Dogwood (*Cornus*), Meadowsweet (*Spiraea alba* ssp. *alba*) and the non-native Glossy Buckthorn (*Rhamnus frangula*). The understorey is this community is diverse and includes mainly wetland species such as Spotted Joe Pye-weed (*Eupatorium maculatum*), Cut-leaved Bugleweed (*Lycopus americanus*), Boneset (*Eupatorium perforatum*), Turtlehead (*Chelone glabra*), Fringed Loosestrife (*Lysimachia ciliata*) and Pink Pyrola (*Pyrola asarifolia*). Toward the railway line, some facultative and upland species enter the understorey, including Wild Strawberry (*Fragaria virginiana*), Hog Peanut (*Amphicarpa bracteata*), Narrow-leaved Goldenrod (*Euthamia graminifolia*), Tall Goldenrod (*Solidago altissima*) and Milkweed (*Asclepias syriaca*). The regionally significant Broom Sedge (*Carex scoparia*) was found in this community.

This area has had virtually no human disturbance as it regenerates. A seldom-used trail runs along the shoreline and, aside from the presence of Glossy Buckthorn, invasive species are few. In time, it will likely regenerate rapidly into an early successional deciduous swamp or possibly moist deciduous forest.

#### **Community 15: Fresh – Moist White Cedar Coniferous Forest (FOC 4-1)**

The largest forested area south of the Jock River mainly consists of greater than 75% stand composition of mature White Cedar (*Thuja occidentalis*). In some patches, White Cedar forms dense patches almost to the exclusion of all other species, and with a very dark and sparse understorey. However, most of this community is best characterized as mature White Cedar, with some large deciduous trees in the canopy and supercanopy, and a relatively diverse understorey. At low levels (<25% overall) throughout the overstorey and sapling layers are deciduous species such as Sugar Maple, Basswood, White Elm and Ironwood, and in very small pockets (much less than 0.5 ha), these may even dominate. The sparse shrub layer consists of deciduous saplings of the above species, and also species such as Red Elderberry (*Sambucus pubens*) and Alternate-leaved Dogwood (*Cornus alternifolia*). Species common in the groundcover layer include Poison Ivy (*Toxicodendron radicans*), Enchanter's Nightshade (*Circaea quadrisulcata*), Sweet Cicely (*Osmorhiza claytonii*), Bulblet Fern (*Cystopteris bulbifera*) and Common Speedwell (*Veronica officinalis*).

#### **Community 16: Fresh – Moist White Cedar – Hardwood Mixed Forest (FOM 7-2)**

This forest polygon is separated from the adjacent conifer forest polygon because it has greater than 25% stand composition of deciduous tree species, and is therefore considered to be a mixed forest. The main deciduous species in the canopy here is Sugar Maple (*Acer saccharum*), but also common are Ironwood,

Basswood, and some Black Cherry (*Prunus serotina*). This area is drier overall than the White Cedar Coniferous Forest described above. The shrub layer and understory contain species including the ones described for the coniferous forest, but in areas some species more characteristic of upland deciduous forests appear, such as White Trillium (*Trillium grandiflorum*), Red Baneberry (*Actaea rubra*), Rolled-up Sedge (*Carex rosea*), Peduncled Sedge (*Carex pedunculata*), Canada Mayflower (*Maianthemum canadense*) and Blue Cohosh (*Caulophyllum thalictroides*).

#### **Community 17: Fresh – Moist Ash Lowland Deciduous Forest (FOD 7-2)**

This very moist forest borders directly on the thicket swamp and demonstrates gradational change between upland and wetland. The dominant overstorey species in this community is Green Ash (*Fraxinus pennsylvanica*), but poplars (Balsam Poplar and Trembling Aspen) and White Birch are also common. Understorey species include Black Currant (*Ribes americanum*), Common Speedwell (*Veronica officinalis*), Tall Goldenrod (*Solidago altissima*), Virginia Creeper (*Parthenocissus inserta*), Ox-eye Daisy (*Chrysanthemum leucanthemum*) and Wild Grape (*Vitis riparia*).

#### **Community 18: Reed Canary-grass Mineral Meadow Marsh (MAM 2-2)**

The shoreline meadow marsh dominated by Reed Canary Grass (*Phalaris arundinacea*) is also present in a narrow band along the south shore of the Jock River. The community composition is very similar to the community on the opposite (north) shore, with commonly occurring species including Broad-leaved Cattail (*Typha latifolia*), Canada Bluejoint (*Calamagrostis canadensis*) and Spotted Joe-Pye Weed (*Eupatorium maculatum*), Swamp Meadow Grass (*Poa palustris*), Black Bulrush (*Scirpus atrovirens*), Woolgrass (*Scirpus cyperinus*), Marsh Vetchling (*Lathyrus palustris*), Hog Peanut (*Amphicarpa bracteata*), and Cow Vetch (*Vicia cracca*).



Figure 2. Current vegetation and tree distribution.

## 2.3 Site Trees

Trees and small tree clusters not within the wooded areas or dense hedge rows are individually noted (Figure 2). However, heavily wooded areas and hedgerows contain too many trees to practically list every individual over 10 cm DBH. Species lists are provided within the land cover descriptions for woodland area ELC Communities (Section 2.2), and within the hedgerow descriptions below. A wooded area adjacent to Mattamy's property (W3) is also briefly described below. For these areas only significantly sized trees (i.e., >50 cm DBH) are individually identified. Trees within forested communities of the Jock River Corridor (i.e. in the south west corner of the property) are located outside of the area of proposed development and thus no specimens are described individually. Tree records are detailed in Table 1. Descriptions and measurements of individual trees on tree survey results by H. Bickerton and A. Francis on September 1, 2009 and as updated by R. Hallett over several site visits in November and December 2012.

Since the original site visit, Emerald Ash Borer (EAB) (*Agrilus planipennis*) has become prevalent throughout the Ottawa area, resulting in high mortality and heavy dieback of ash trees in the region. A final site-visit by KAL biologist Terry Hams on December 19, 2017 found that ALL medium-sized or larger ash trees within features listed below had been negatively impacted by EAB and were either dead or dying. Mr. Hams also sought out Butternuts within the features, but found that none had become established there in since the 2012 sit checks.

### **Hedgerow 3 (H3)**

This hedgerow is about 10 m in width and is dominated by trees >10 m in height. In spring, a drain runs through the centre. Dominant trees are Bur Oak and Trembling Aspen with some Green Ash, White Elm, Largetooth Aspen, and Basswood. Common species in the shrub layer are Wild Black Currant (*Ribes americanum*), Prickly Gooseberry (*Ribes cynosbati*), European Buckthorn (*Rhamnus cathartica*), Red Raspberry (*Rubus ideaus* ssp. *strigosus*), Pussy Willow (*Salix discolor*), Manitoba Maple (*Acer negundo*), Dogwoods (*Cornus* sp.) and Hawthorns (*Crataegus* sp.). Common understorey species are mix of native and non-native species, including Field Horsetail (*Equisetum arvense*), Poison Ivy (*Toxicodendron radicans*), Cow Parsnip (*Pastinaca sativa*), Wild strawberry (*Fragaria virginiana*), (*Viola sororia* ssp. *affinis*), Small-flowered Buttercup (*Ranunculus abortivus*), and Ground Ivy (*Glechoma hederacea*). This hedgerow is linked with other hedgerows, but not with any large natural areas, and likely functions minimally as a wildlife corridor, probably for human-tolerant species such as squirrels, raccoons, deer and coyotes.

### **Hedgerow 4 (H4)**

Just to the south of Hedgerow 3 is a similar hedgerow that is approximately the same width (10 m) but does not have a drain running through it. It is also dominated by larger trees (>10 m in height) such as White Elm, Green Ash, and Manitoba Maple, and some White Birch and Balsam Poplar are also present. Common shrubs include saplings of the above, as well as young Black Cherry (*Prunus serotina*), Nannyberry (*Viburnum lentago*), Wild Black Currant (*Ribes americanum*), Red Raspberry (*Rubus ideaus* ssp. *strigosus*), and Hawthorn (*Crataegus chrysocarpa*). Understorey species are typical of disturbed sites and include Burdock (*Arctium minus*), Virginia Creeper (*Parthenocissus inserta*), Cow Parsnip (*Pastinaca sativa*), Field Horsetail (*Equisetum arvense*), and Corn Speedwell (*Veronica arvensis*).

### **Hedgerow 5 (H5)**

This hedgerow extends along the west side of the Richmond development area from Perth St. to W3; thus only the southern end is located on Mattamy property. It consists mainly of mature trees, especially at its northern end. Common species are Green Ash, some Black Ash, and Bur Oak, with some Basswood and White Birch. Shrub and ground flora species are Nannyberry (*Viburnum lentago*), Hawthorns (*Crataegus* sp.), Riverbank Grape (*Vitis riparia*), Virginia Creeper (*Parthenocissus inserta*), as well as pasture grasses and weeds. Only one significantly sized tree, a large multi-stemmed Burr Oak occurs on Mattamy's portion of the hedge.

#### **Hedgerow 6 (H6)**

This is a treed hedgerow, quite wide in places (approximately 8 to 10 m) with drainage through the centre of it, mostly stagnant shallow standing water by mid-August. Trees are mature, especially towards the southern end of this hedgerow, including Green Ash, Manitoba Maple, and White Elm, and a shrub layer of Hop Hornbeam, Prickly Ash (*Zanthoxylum americanum*), Hawthorns (*Crataegus* sp.), Wild Red Currant (*Ribes triste*) and Canada Plum (*Prunus nigra*). Along the edges of the hedgerow, the ground flora include field species such as Burdock (*Arctium minus*), Deadly Nightshade (*Solanum dulcamara*), Common Milkweed (*Asclepias syriaca*), Calico Aster (*Symphotrichum lateriflorus*) and some wetland vegetation along the drainage line (e.g., Reed Canary Grass (*Phalaris arundinacea*), Narrow-leaved Cattail (*Typha angustifolia*)). Under the canopy there are shade-tolerant understory species such as Snowberry (*Symphoricarpos albus*) Pennsylvania Sedge (*Carex pensylvanica*), Common Speedwell (*Veronica officinalis*), Enchanter's Nightshade (*Circaea quadrisulcata*) and two large patches of non-native Lily-of-the-Valley (*Convallaria majalis*). The drainage line shows signs of beaver activity and human disturbance (i.e., garbage dumping), and the alien invasive shrub, Glossy Buckthorn (*Rhamnus frangula*), is present in low numbers throughout. This hedgerow likely provides some wildlife habitat, although it does not connect any large natural areas.

#### **Hedgerow 7 (H7)**

This short hedgerow follows the fence line and ditch on the west side of the property from W3 to Ottawa St. It consists only of young Balsam Poplar (*Populus balsamifera*), American Elm (*Ulmus americana*) and Glossy Buckthorn (*Rhamnus frangula*), much of it tangled with Riverbank Grape (*Vitis riparia*), and Virginia Creeper (*Parthenocissus inserta*). All trees here are of less than 25 cm dbh.

#### **Hedgerow 8 (H8)**

Hedgerow 8 consists of a thin, single line of trees on the west side of the property south of Ottawa St. It includes Balsam Poplar (*Populus balsamifera*), Trembling Aspen (*Populus tremuloides*) mixed with Red-osier Dogwood (*Cornus stolonifera*) and willow species (dbh all less than 25 cm). A drainage ditch and old pathway run behind the tree line separating it from the former northward extension of NESS 422, which now forms rear yard space to houses along Sangeet Pr. and contains Buckthorn, Red Maple and Burr Oak.

#### **Hedgerow 9 (H9)**

Hedgerow 9 is a somewhat scattered line of trees on the east side of the property south of Ottawa St., separating Mattamy's property from neighbouring fields. It includes Green Ash (*Fraxinus pennsylvanica*), Manitoba Maple (*Acer negundo*), European Buckthorn (*Rhamnus cathartica*), White Cedar (*Thuja*

*occidentalis*), and two American Elm (*Ulmus americana*). One Green Ash near the south end of the hedge has a dbh 40cm. All other trees are less than 25 cm dbh.

### Woodland 3 (W3)

This woodland is not contained on Mattamy's property and as such was observed only from the eastern edge, which abuts the property boundary. It appears to have large patches of poplars, especially Large-tooth Aspen, as well as White Elm, White Birch, Burr Oak and Green Ash. Along the margin, there are shrubs and vines such as Nannyberry and Virginia Creeper. Several trees are located immediately behind the property line including one very large Green Ash (dbh 107 cm).

**Table 1. Trees and small tree clusters on the site.**

Tree Number	Tree Description	Size (DBH in cm)	Remarks
1	Green Ash	m	Sick and dying, EAB
2	Green Ash	s	Sick and dying, EAB
3	Burr Oak	s	
4	Green Ash	s	Sick and dying, EAB
5	Green Ash	s	Dead, EAB
6	Dead Ash	s	
7*	Green Ash	63	Sick and dying, EAB
8*	Green Ash	70	Sick and dying, EAB
9*	Green Ash	51	Sick and dying, EAB
10*	Green Ash	50	Sick and dying, EAB
11*	Green Ash	51	Sick and dying, EAB
12*	Green Ash	54	Sick and dying, EAB
13*	Green Ash	55	Sick and dying, EAB
14*	Bur oak	xl	
15*	Green Ash	xl	Sick and dying, EAB
16*	Green Ash	60	Sick and dying, EAB
17*	Bur oak	69	
18*	Bur oak	55	
19*	Bur oak	53	
20	Green Ash	62	Sick and dying, EAB
21	Ash	107	Sick and dying, EAB
22	Green Ash	xl	Sick and dying, EAB
23	Green Ash	51	Sick and dying, EAB
24	Green Ash	63	Sick and dying, EAB
25	Green Ash	m	Sick and dying, EAB
26*	Trembling Aspen	51	
27	Green Ash	59	Sick and dying, EAB
28	Green Ash	51	Sick and dying, EAB
29	Ash	53	Sick and dying, EAB
30	Green Ash	52	Sick and dying, EAB
31	Green Ash	60	Sick and dying, EAB
32	Green Ash	xl	Sick and dying, EAB
33	Green Ash	xl	Sick and dying, EAB
34	Green Ash	76	Sick and dying, EAB
35	Green Ash	51	Sick and dying, EAB
36	Green Ash	52	Sick and dying, EAB
37	2 Ash	52	Sick and dying, EAB



Tree Number	Tree Description	Size (DBH in cm)	Remarks
38	Green Ash	54	Sick and dying, EAB
39	Green Ash	xl	Sick and dying, EAB
40	Green Ash	50	Sick and dying, EAB
41*	Trembling Aspen	52	
42	Manitoba Maple	s	
43	White Cedar	s	
44	4 Balsam poplar	s	
45*	Ash	57	Sick and dying, EAB
46	Cedar	s	
47	European buckthorn	s	
48	Ash	s	
49	Ash	s	
50	Manitoba Maple	s	
51	Yellow birch	s	
52	American Elm	s	
53	White Cedar	s	
54	16 Manitoba Maple	s	
55*	White Cedar	54	
56	White Cedar	m	
57	American Elm	s	
58	Ash	s	
59	White Cedar	s	
60	3 Manitoba Maple	s	
61	Manitoba Maple	s	
62	Balsam poplar	s	
63	White Cedar	s	
64	Sugar maple	s	
65	Trembling Aspen	s	
66	Hawthorn	s	
67	Burr Oak	s	
68	Black Ash	s	
69	Hawthorn	s	
70	Green Ash	s	
71	Burr Oak	s	
72	Green Ash	s	
73*	American Elm	52	
74	Black Ash	s	
75*	White Elm	107	
76	Snag	s	
77	Common Apple	s	
78	Black Ash	s	
79	Manitoba Maple	s	
80	Burr Oak	s	
81	4 Green Ash	s	
82	Black Ash	s	
83	Common Apple	s	
84	Ash	m	Sick and dying, EAB
85	Red Oak	s	

Tree sizes: s=10-34 cm DBH, m=35-49 cm DBH, xl > 75 cm DBH but with multiple stems splitting near breast height, \* indicates a specimen tree (>50 cm DBH, reasonably healthy, non-invasive).

### **2.3.1 Ecological Significance of Trees on the Site Areas Subject to Development**

In areas on site directly within or adjacent to areas of proposed development/construction, i.e. excluding forested areas along the Jock River, 38 trees are large enough to be considered specimen trees (i.e. > 50 cm DBH and in reasonably good health), none of the species was unusual or regionally significant.

The main ecological functions of the existing trees within the area of development are:

- To provide some cover, food (e.g., flowers, insects) and perching areas for field birds and small mammals that use the site.
- To provide shelter, shade, and a windbreak for birds and small mammals that use the site.
- To provide minor corridor routes for small mammals such as squirrels, raccoons, foxes, and deer. The hedge rows do not contain provide significant linkages or connections as identified in Ottawa's Greenspace Master Plan and are not ecologically significant.

Trees within W3 generally appear to be under 80 years old, though some of the larger trees within Community 2 are likely older. Neither woodlot provides "interior forest" or meets the criteria necessary to be classified as significant woodland.

During the additional field survey in December, 2017, evidence of EAB was observed through the area. This has resulted in a substantial loss of the integrity of the hedgerows and their ecological functions due most ash species showing mortality or heavy dieback. The removal of these hedgerow to slow the advance of EAB in the area is warranted.

### **2.3.2 Ecological Significance of Treed Areas Adjacent to the Jock River**

The Marlborough Forest (NESS 422) encompasses over 12,000 ha between Smiths Falls and North Gower. This forest includes many areas of interior and deep interior forest ecosystem with high ecological significance. Communities 9, 11, 12 and 13 are part of this forest system providing interior forest cover at the south west corner of the site and include many older trees and a woodland pool. As such, this corner of the site is identified in Ottawa's Greenspace Master Plan as ecologically significant.

Community 8, a small (1 ha) finger of Ash Deciduous Forest extending eastward from the Marlborough Forest along moist Jock River riparian soils consists mostly of Green Ash (*Fraxinus pennsylvanica*) with some Black Ash (*Fraxinus nigra*), White Cedar (*Thuja occidentalis*) White Elm (*Ulmus americana*) and Manitoba Maple (*Acer negundo*). Trees here are all under 50 cm dbh and are common, and thus do not constitute specimen trees. However, trees here provide habitat for birds and small mammals and a significant corridor identified in Ottawa's Greenspace Master Plan as ecologically significant.

## **2.4 Site Fauna**

### **2.4.1 Amphibians and Reptiles**

Six amphibian species have been observed or heard on the site. Of these, five species were widespread and/or abundant on the property (American Toad, Bullfrog, Green Frog, Northern Leopard Frog, Spring Peeper). Only Wood Frogs were infrequently heard along the northern shoreline of the Jock River in early spring in 2009. One reptile species, an Eastern Garter Snake, was observed on two separate field visits. All species are common in Ontario.

An additional frog survey following the Marsh Monitoring Program protocol (Bird Studies Canada, 2003) was conducted in the wetland areas along the Jock River by Holly Bickerton and Liza Hamilton on April 29, 2011 targeting early breeding frogs, specifically Chorus frogs. The only frog species observed during that survey were American Toad and Northern Leopard Frog. These species are generally considered middle breeders (i.e. mid May to mid-June). A slightly earlier attempted frog survey on April 14, 2011 by Rick McCulloch, found evening temperatures of only 0°C, and thus no frog activity at all.

### **2.4.2 Mammals**

Five mammal species (or their signs) were observed on the site during field visits between March and August of 2009. White-tailed deer were observed on three separate occasions and likely breed on or near the property, as one observation was a young fawn. A coyote was startled, possibly from its den, on the edge of the woodland north of Perth Street in early spring, and coyote scat was found nearby on a separate occasion. Beavers likely use the area near the Jock River, where characteristic chewed tree stumps were found. One Eastern Cottontail Rabbit was observed on the property, and Raccoon tracks were found in two locations. Both of these species likely use, and may even breed on the property. All species observed are common in Ontario. Deer, raccoons, and grey squirrels (and/or their tracks) have been observed numerous times on the property since the initial 2009 surveys.

### **2.4.3 Birds**

During surveys between March and August 2008, 51 bird species were identified on the Mattamy lands, and another three species were identified just off the property (i.e., less than 100 m) and likely also use the area (KAL and Parish, 2010). Twenty-four of these species were identified as probable breeders, mainly by the presence of singing males in suitable habitat. Another twenty species probably breed on Mattamy lands, i.e., breeding pairs, courtship displays, or frequent territorial singing were observed. The remaining seven species were observed on the property but were not necessarily displaying breeding behaviours. It was considered at the time that these species probably used the property for feeding or shelter.

Bobolink are among the bird species observed in 2008 and an Eastern Meadowlark was heard nearby. Both species are listed in Ontario as **Threatened** under the *ESA*. All fields north and south of Ottawa St. however, have historically been subject to regular active agriculture as evidenced in Ottawa eMap air photos from 2002 and 2005. Ottawa eMap air photos from 2008 showed plow lines over most of the area with only the eastern most portion of the fields south of Ottawa St. appearing to be fallow. The summer of 2009 saw significant earth works south of Ottawa St. with a berm along the south edge of the field

moved northward to the regulatory floodplain limit so as to re-establish the natural floodplain area and capacity under order of the RVCA. During the work, much of the southern portions of the fields were scraped and re-graded. Thus historically, this agricultural area as whole has likely been of limited utility to grassland birds, providing habitat only occasionally in portions left fallow or sown with a suitable crop (i.e. hay) for a season.

In the summer of 2011, large portions of the agricultural fields were left fallow (KAL 2012). The fields near Ottawa St. were visited three times in spring and early summer 2011, to determine the presence and habitat use of these bobolink and meadowlark (KAL 2012). The westernmost fallow fields between Ottawa Street and the Jock River were dominated by the non-native Reed Canary Grass (*Phalaris arundinacea*). Other pasture grasses such as Timothy (*Phleum pratense*), and Bluegrasses (*Poa* spp.) were scattered throughout. The easternmost field south of Ottawa Street (fronted by homes along the road) was dominated by forbs such as Common Milkweed, Cow Vetch, Bird's-foot Trefoil, and Sweet White Clover (*Melilotus alba*). Grasses such as Timothy and Reed Canary Grass constituted less than 50% of the cover here.

In total, ten point count stations were established in open areas containing suitable habitat for grassland birds (KAL 2012). Transects and point count surveys were completed on:

- 31 May (7:25-10:30 am, H. Bickerton)
- 28 June (7:30-10:00 am, H. Bickerton); and,
- 12 July (7:30-10:30 am, H. Bickerton and M. Murphy).

Survey and point count methods followed OMNR protocols (OMNR 2011). Weather on each day was suitable for observation (clear or overcast, calm to light wind, no precipitation). Other bird species observed and heard were also recorded.

During the 2011 survey, at least 6 pairs of Bobolink were observed using areas of the fallow fields to the north and south of Ottawa Street. Breeding behaviour, such as courtship displays, territorial flights, consistent observation of pairs within the same area, and the carrying of food (presumably to young in the nest) were also observed, and breeding in this area is considered certain.

Pairs did not appear to use the area along the raised berm and to the south (toward the river). This may be because this area contained taller (and very dense) grasses (Reed Canary Grass) than areas to the north, toward Ottawa St., and may be somewhat less appealing to Bobolink. During fieldwork, thirty other bird species were observed or heard on the property (no new species from previous surveys). Eastern Meadowlark was not among them.

Since the original birding work was completed, both Barn Swallows and Bank Swallows have been added to the list of species protected under the *ESA*. Neither species however, was observed on site during the bird surveys conducted for the area.

During 2012, fields north of the Ottawa St. and central and western fields south of Ottawa St. returned to active soybean agriculture. The eastern most field south of Ottawa St. currently has limited soil cover and

is being maintained with limited vegetative cover to limit weed growth in the adjacent crop areas. Areas currently cropped with corn or soy are not considered to be suitable for Bobolink (COSEWIC 2010).

## **2.5 Aquatic Ecological Features**

### **2.5.1 Site Drainage Fabric**

The drainage fabric for the Mattamy Richmond Land is illustrated in Figure 3. The naming system used here for drain reaches is consistent with previous studies (KAL and Parish 2010, KAL 2009). Channel descriptions and habitat assessments are also taken directly from those reports. Drainage from Mattamy lands on the north side of Ottawa Street flows north through a hedge row, then north-east through a second hedge row (VG-R3-2) to the Moore Branch (VG-R3, VG-R3-1). The Moore Branch enters the Van Gaal Drain ~ 150 m upstream of Fortune Street. Drainage on Mattamy's property south of Ottawa Street flows down a deep, 450 m, linear channel (JED-1) emptying into the riparian wetland areas along the Jock River. JED-1 was constructed for the purposes of stormwater management for the adjacent Jock River Estates. It receives flow from the Ottawa St. road side ditch and runoff from the adjacent agricultural fields.

Flows in the Moore Branch are maintained by cool groundwater seeping from a tile drain at a hedgerow separating Sections 2 and 3. Water quality is good with basic pH (~ 7.5), high hardness (> 300 mg/L), non-detectable total phosphorus concentrations and low solids (TSS ~ 4 mg/L). Bankfull widths of the Moore Branch were variable (4 to 7 m) with bankfull depths of between 0.6 and 1.0 m. Bank materials consist of clay and silt. Vegetation in the branch consisted of grasses and herbs with more shrubs and trees in the riparian zone further upstream in the reach. Bank-side vegetation provided nearly 100% canopy cover in summer. Minor woody debris was observed at several locations.

The Moore Branch was utilized by 15 fish species during the spring high-flow event in 2008 (Table 2). White sucker, northern redbelly dace and pearl dace were found upstream as far as Ottawa Street along VG-R3-2. The fish community in the lower part of the Moore Branch also included high relative numbers of creek chub and common shiner. Of the 15 species found in the spring, only four were found in the Moore Branch in early August: central mudminnow, creek chub, pearl dace, and brook stickleback. A single central mudminnow was found in the branch near VG-R3-2(2) on August 9, 2008. Downstream of that point, the drain was dry, resulting in the mudminnow (and any other fish that were in the upstream reach) being stranded. On August 9, 2008, the drain contained water to depths of approximately 4 to 8 cm, and 1 to 1.5 m wide. There were, however, no other fish observed in the upstream reach on that day. The absence of fish would appear to reflect that the upper drain periodically goes dry or anoxic. The Moore Branch was flowing through to August 9, 2008, the last time the site was visited in 2008, with flows provided by a tile drain.

The upper sections of the drain provide spawning habitat for 15 species of fish, but it is likely that many of those fish become stranded and perish. A high point in VG-R3-2 (i.e., the split between Sections 6 and 7) causes that tributary to dry from the most downstream sections first, effectively stranding fish in the upper reach. Adult cyprinids clearly access this tributary during the spring to spawn. As waters recede, adult fish may move downstream prior to becoming stranded. Young (fry) would be less likely to move downstream because they tend to have greater site fidelity and move passively with currents. Fry

stranded by the high point would perish as waters heat up or evaporate. Although the Moore Branch has water temperatures indicating cool-water, it did not produce mottled sculpin, probably because the water was generally too shallow.

During the spring of 2008, JED-1 contained five species of fish in relatively low abundances (KAL and Parish 2010). Central mudminnow and fathead minnow were the most dominant fishes in the spring collection. There were no pike or other esocids. The same set of species, but minus the bluntnose minnow, was also collected in the early August inventory.

## 2.5.2 Aquatic Habitats

### Moore Branch Sections 7 and 8

As part of subsequent discussions with RVCA, Lamoureux (2009) classified aquatic habitat upstream of the high point in VG-R3-2 (i.e., Sections 7 and 8) as **Intermittent Indirect Fish Habitat**. As a result of that classification, Sections 7 and 8 are further classified as having **low sensitivity**. These Sections of the Moore Branch are used principally for spawning, but there is an expectation that they dry and that many of the young of year perish. Each of the species that use these sections is able to use other habitats locally or regionally for spawning and rearing.

### Moore Branch Section 5

Section 5 of the Moore Branch is **Indirect Fish Habitat**, not supporting fish of any life-stage at any time, but being a source of surface water during periods of high flow. Being of indirect fish habitat, this section is also considered to be of **low sensitivity**.

### Moore Branch Sections 3, 4 and 6

Sections 3, 4 and 6 of the Moore Branch are **Intermittent Direct Fish Habitat**, containing fish during periods of high flow, providing spawning habitat for a variety of cyprinids, but going dry during summer months. The subsequent fry that develop in these sections would be able to freely move downstream as water levels recede. These sections are considered to be of **low sensitivity** because fish that use these sections for spawning could use other local or regional headwater streams for the same life processes.

### Moore Branch Sections 2

Section 2 is considered **Permanent Direct Fish Habitat**, with flows maintained year-round by a tile drain at the top of the Section. This section is classified as **Low Sensitivity**. It provides a source of cool groundwater, and contain a few cold/cool-water species of fish. Few species use this section during the summer, though several species use this section as a corridor during spring spawning. Other local or regional headwater streams could be used by the species found in the Moore Branch for the various life-cycle stages. The habitat is not rare, and it is conceivable that these sections could be replaced (if necessary) elsewhere with a minor residual negative effect.

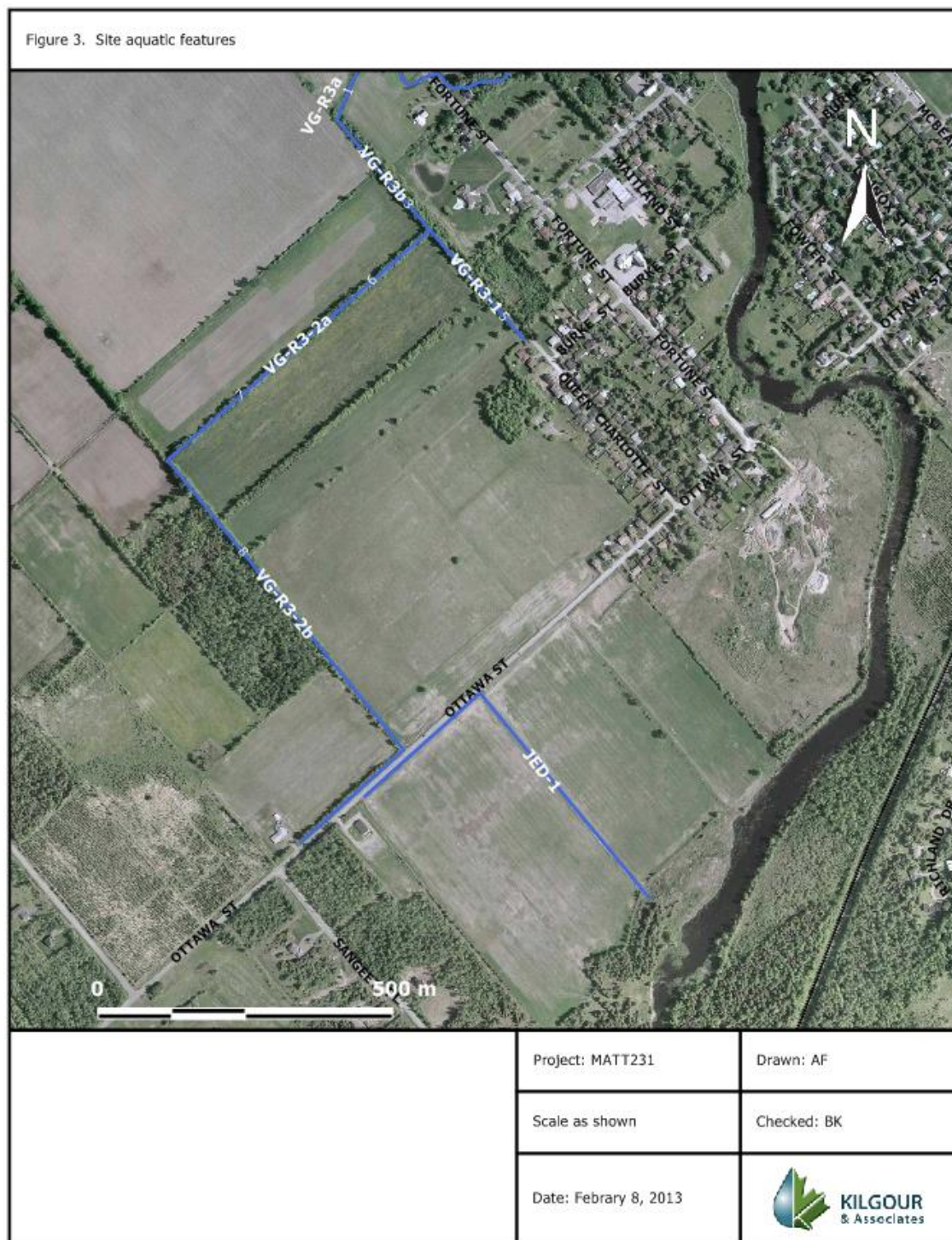
### Moore Branch Section 1

Section 1 is on Mattamy's property. This section is **Permanent Direct Fish Habitat**. The section is classified as **moderately sensitive** fish habitat because of the possibility that pike use this lower section of the

Moore Branch for spawning. The habitats provided by this section are not unique or rare, and could be obtained by pike either locally or regionally.

#### Jockvale Estates Drain

This feature provides artificial fish habitat that did not occur prior to its construction. It is considered to have **low sensitivity** to land development because it a man-made feature that provides no unique habitat that is not available elsewhere.



**Figure 3. Site aquatic features**



**Table 2. List of species reported from the Moore Branch and their ecological sensitivities.**

Common Name	Scientific Name	Socio-economic Importance			Status	Trophic Guild <sup>6</sup>	Repr. Guild <sup>7</sup>	Thermal Class	Preferred Temp.	Sensitivity to Sediment/Turbidity <sup>8</sup> (High, Moderate, Low)		
		Rec	Comm.	Bait						Repr	Feed	Resp
central mudminnow	<i>Umbra limi</i>			x		I/O	A.1.5	cool/warm		M	M	L
white sucker	<i>Catostomus commersoni</i>					I/O	A.1.3	cool	22.4	M	L	H
northern redbelly dace	<i>Phoxinus eos</i>			x		H	A.1.5	cool/warm	25.3	M	L	L
brassy minnow	<i>Hybognathus hankinsoni</i>			x	NAR	O/H	A.1.4	cool		M	L	
silvery minnow	<i>Hybognathus nuchalis</i>			x		H	A.1.4	cool/warm		M	L	
golden shiner	<i>Notemigonus crysoleucas</i>			x		O	A.1.5	cool	23.8	M	M	L
common shiner	<i>Luxilus cornutus</i> *			x		I	B.2.1	cool	21.9	M	M	
blacknose shiner	<i>Notropis heterolepis</i>			x		I	A.1.6	cool/warm		M	M	H
bluntnose minnow	<i>Pimephales notatus</i>			x		O	B.2.3	warm	29	M	L	
fathead minnow	<i>Pimephales promelas</i>			x		O	B.2.3	warm	29	L	L	
blacknose dace	<i>Rhinichthys atratulus</i>			x		I/Ge	A.1.3	cool	24.6	M	M	H
longnose dace	<i>Rhinichthys cataractae</i>			x		I	A.1.3	cool	20.6	M	M	H
creek chub	<i>Semotilus atromaculatus</i>	x		x		I/Ge	A.2.1	cool	20.8	M	H	H
pearl dace	<i>Margariscus margarita</i> *			x		I	A.1.3	cold/cool	16.2	M	M	H
brook stickleback	<i>Culaea inconstans</i>			x		I	B.2.5	cool	21.3	L	M	

Table Note: Ecological attributes are from MTO (2006) and Coker et al. (2001).

## 2.6 Species at Risk and their Habitat

### 2.6.1 Results of Database and Site Searches

An information update request for NHIC records relevant to the area was filed with the Kemptville MNR Office on December 6, 2012. The MNR indicated, based on existing records and aerial photo interpretation, the possible presence of the following species: Bobolink (**THR**), Butternut (**END**), Eastern Meadow Lark (**THR**), Henslow's Sparrow (**END**), and King Rail (**END**). The MNR additionally noted the possible presence of Yellow Rail (**SC**).

Bobolink, Butternut, and Eastern Meadow Lark have been observed on or near the property as indicated above in sections 2.2 (Communities 11 and 13) and 2.4.3. Henslow's sparrow is extremely rare and was last reported from over 10 km to the south east in 1975. Ontario Breeding Bird Survey data for 1981-1985 places the nearest observation of the species past Brockville. Survey data for 2001-2005 place the nearest record near Lake Simcoe. The species requires meadow habitat with long grasses. While this habitat type is occasionally present agricultural fallow cycles, the species is not considered to be present. King rail is also extremely rare. The nearest public NHIC record was from 35km to the east from 1931. Ontario Breeding Bird Survey records past 1981 consistently place the closest record at over 100 km away. This species is also not considered to be present. Yellow rail, also rare near Ottawa, were not observed during area bird surveys in 2008 or 2011. Moreover, being listed only as special concern, they do not have habitat protection under the *ESA*, though individuals are protected under the *Fish and Wildlife Conservation Act*.

Table 3 below provides an overview of potential species at risk occurrence and habitat availability on and near the Mattamy's Richmond site. It has been updated to include SAR that have been listed since the Kilgour 2013 report.

**Table 3. Species at Risk summary for the Hope Side Road land parcel.**

Species Name	Provincial (ESA) Status	Habitat Requirement	Habitat/Occurrence on Site	Project Concerns Associated Species or its Habitat
<b>Plants</b>				
Eastern Prairie Fringed-orchid ( <i>Platanthera leucophaea</i> )	Endangered.	Tamarack swamps in the Ottawa area.	Not observed on site. No suitable habitat on or adjacent to the site.	Negligible potential for presence. Not a concern.
American Ginseng ( <i>Panax quinquefolius</i> )	Endangered	Moist, mature deciduous forest	Not observed on site. Potentially suitable habitat at south-most end of site.	Limited potential for presence but suitable habitats are well removed from proposed development areas. Not a concern.
Butternut ( <i>Juglans cinerea</i> )	Endangered	Variable but typically on well-drained soils.	Two trees were observed within the NESS area near the Jock River. Entire site provides suitable habitat	None present within 50 m of development areas. Limited concern for project. Tree lines should be rechecked for Butternut presence if not cleared by December 2019.
<b>Insects</b>				
Monarch butterfly ( <i>Danaus plexippus</i> )	Special Concern	Widespread in meadows, especially with abundant milkweed.	No reported occurrences. Sparse Milkweed in open areas along the Jock River provide some habitat potential.	Limited potential for presence in development areas. No relevant protections under the ESA. Not a concern.
<b>Fish</b>				
American Eel ( <i>Anguilla rostrata</i> )	Endangered	Ottawa, Mississippi and Rideau Rivers only.	Not observed on site. No known habitat on or adjacent to the site.	Negligible potential for presence. Not a concern.
Bridle Shiner ( <i>Notropis bifrenatus</i> )	Special Concern	Rideau River	Not observed on site. No known habitat on or adjacent to the site.	Negligible potential for presence. Not a concern.
<b>Reptiles</b>				
Blanding's Turtle ( <i>Emydoidea blandingii</i> )	Threatened	Shallow aquatic habitats with moderate to thick vegetation.	No reported occurrences. Suitable habitat would be limited to the Jock River and wetland areas along its riparian zone.	Limited potential for presence but suitable habitats are well removed from proposed development areas. Not a concern.
Eastern Musk Turtle ( <i>Sternotherus odoratus</i> )	Threatened	Species prefers shallow, still water with muddy bottom.	No reported occurrences. Suitable habitat would be limited to the Jock River and wetland areas along its riparian zone.	Limited potential for presence but suitable habitats are well removed from proposed development areas. Not a concern.
Eastern Ribbonsnake ( <i>Thamnophis sauritus</i> )	Special Concern	Semi-aquatic, found along edges of ponds, streams, bogs.	No reported occurrences. Suitable habitat would be limited natural areas along the Jock River.	Some potential for presence but suitable habitats are well removed from proposed development areas. Not a concern.
Snapping Turtle ( <i>Chelydra serpentina</i> )	Special Concern	A variety of creek, river and lake environments.	No reported occurrences. Suitable habitat would be limited to the Jock River and wetland areas along its riparian zone.	Some potential for presence but suitable habitats are well removed from proposed development areas. Not a concern.
Spotted Turtle ( <i>Clemmys guttata</i> )	Endangered	Requires mats within bogs and fens.	No reported occurrences. No suitable habitat on site.	Negligible potential for presence. Not a concern.
<b>Birds</b>				
Bald Eagle ( <i>Haliaeetus leucocephalus</i> )	Special Concern	The huge (1-3m) stick nests of this species are very conspicuous and are	No reported occurrences. No suitable habitat on site.	Negligible potential for presence. Not a concern.

Species Name	Provincial (ESA) Status	Habitat Requirement	Habitat/Occurrence on Site	Project Concerns Associated Species or its Habitat
		usually found in tall, live trees, often near large bodies of water.		
Bank Swallow ( <i>Riparia riparia</i> )	Threatened	Colonial nester; burrows in eroding silt or sand banks, sand pit walls, etc. Individuals and nests also protected under federal Migratory Birds Convention Act	No reported occurrences. No suitable habitat on site.	Negligible potential for presence. Not a concern.
Barn Swallow ( <i>Hirundo rustica</i> )	Threatened	Nests are most commonly located in and around open barns, garages, sheds, boat houses, bridges, road culverts, verandahs and wharfs. Forage and roost near sites close to open habitats such as farmlands, marshes, and lakes.	No reported occurrences. Potential foraging areas over farm fields or near Jock River. No suitable nest-supporting structures on site.	Potential for presence. The site should be rechecked for presence prior to commencement of construction. If the species is observed, the must be registered with the MNRF, thus imposing standard mitigation requirements.
Bobolink ( <i>Dolichonyx oryzivorus</i> )	Threatened	Periodically mown, dry meadow for nesting. Habitat (meadow) should be > 10 ha, and preferably > 30 ha before bobolink are attracted to the site.	Observed in south agricultural fields in year left fallow. All agricultural fields have subsequently had six years of active soybean agriculture and as such are not suitable habitat.	Potential for presence along open natural areas near the Jock River. The proposed development area however, does not include any habitat areas, and converts a 65-180m wide swath of existing farmland (not habitat) to open space (potentially suitable as habitat) as a buffer between new development and existing habitat areas. Not a concern.
Canada Warbler ( <i>Cardellina canadensis</i> )	Special Concern	This species' preferred habitat is wet forest with dense shrubs.	No reported occurrences. Potentially suitable habitat in forests at the south-most end of the site (well removed from development areas)	Negligible potential for presence in or near development areas. Not a concern.
Chimney Swift ( <i>Chaetura pelagica</i> )	Threatened	Nests in open chimneys and sometimes in tree hollows.	No reported occurrences. No suitable habitat on site.	Negligible potential for presence. Not a concern.
Common Nighthawk ( <i>Chordeiles minor</i> )	Special Concern	No reported occurrences. No suitable habitat on site.	No reported occurrences. No suitable habitat on site.	Negligible potential for presence. Not a concern.
Eastern Meadowlark ( <i>Sturnella magna</i> )	Threatened	Periodically mown, dry meadow for nesting. Habitat (meadow) should be > 10 ha, and preferably > 30 ha before bobolink are attracted to the site.	Single call heard in 2008. Not observed during subsequent fallow period. All agricultural fields have subsequently had six years of active soybean agriculture and as such are not suitable habitat.	No suitable habitat. Negligible potential for presence. Not a concern.
Eastern Whip-poor-will ( <i>Antrostomus vociferus</i> )	Threatened	Nests on the ground in open deciduous or mixed woodlands with little underbrush.	Forests at the south-most end of the site (well removed from development areas) provide some habitat potential, though the species was not indicated as a concern by the MNRF.	Negligible potential for presence in or near development areas. Not a concern.
Eastern Wood-pewee ( <i>Contopus virens</i> )	Special Concern	Woodland species, often found near clearings and edges. Individuals and nests protected under federal Migratory Birds Convention Act	Observed in forests at the south-most end of the site (well removed from development areas).	Negligible potential for presence in or near development areas. Not a concern.
Least Bittern ( <i>Ixobrychus exilis</i> )	Threatened	Found in large marshes and swamps, usually near cattails.	No reported occurrences. No suitable habitat on site.	Negligible potential for presence. Not a concern.
Yellow Rail	Special Concern	Extensive sedge meadows and marshes not present on site.	No reported occurrences. No suitable habitat on site.	Negligible potential for presence. Not a concern.

Species Name	Provincial (ESA) Status	Habitat Requirement	Habitat/Occurrence on Site	Project Concerns Associated Species or its Habitat
<b>Mammals</b>				
Little Brown Bat ( <i>Myotis lucifuga</i> )	Endangered	Widespread, roosting in trees and buildings. Hibernates in caves or abandoned mines.	Potentially suitable habitat in forests at the south-most end of the site (well removed from development areas)	Some potential for presence but development areas are well removed from potential roosting sites. Feeding areas near suitable habitat will remain open.  No concern for habitat, but tree clearing, where required, should be done outside of bat roosting season (i.e. between October and April to ensure safety of individuals).
Northern Long-eared Bat ( <i>Myotis septentrionalis</i> )	Endangered	Associated with boreal forests, choosing to roost under loose bark and in the cavities of trees. Hibernates in caves or abandoned mines.	No suitable habitat.	Negligible potential for presence. Not a concern.
Eastern Small-footed Bat ( <i>Myotis leibii</i> )	Endangered	Coniferous forest in hilly country. Hibernates in smaller caves subject to air movement.	No suitable habitat.	Negligible potential for presence. Not a concern.
Eastern Pipistrelle ( <i>Pipistrellus subflavus</i> )	Endangered	Forage over water courses or open fields with large trees nearby. They never forage in deep woods. Hibernates in caves or abandoned mines.	Potentially suitable habitat in forests at the south-most end of the site (well removed from development areas)	Some potential for presence but development areas are well removed from prime potential roosting sites. Feeding areas near suitable habitat will remain open.  No concern for habitat, but tree clearing, where required, should be done outside of bat roosting season (i.e. between October and April to ensure safety of individuals).

Species has some potential concern to project.

## **2.7 Other Significant Features**

There were no other previously identified significant ecological features or functions identified for this site.

- No Provincially Significant Wetlands (PSWs) occur on or adjacent to the property. The Richmond Fen Provincially Significant Wetland is located approximately 700 m upstream to the south and west of the site.
- No Areas of Natural and Scientific Interest are found near the property. The nearest ANSI – the Richmond Forest ANSI, a regionally significant upland deciduous forest – is located approximately 3 km to the northeast of the village of Richmond.

## **3.0 DESCRIPTION OF THE PROPOSED PROJECT**

### **3.1 Proposed Development**

The current subdivision concept plan is shown in Figure 4. This EIS is provided in support of the Plan of Subdivision submission for the site. Servicing for the site is set to commence in late-2018 and home construction in 2019.

All areas north of Ottawa Street will be developed primarily with residential housing, with associated school, park, and limited commercial spaces. Hedgerows H5, H6 and H7, as well as the eastern edged of woodlot W3 will be retained. H5 has many large trees north of Mattamy's site but is quite sparse with only smaller shrubs at the property line. Site grade raises tapering to existing grade here are unlikely to have negative impacts. One large multi-stemmed Burr Oak however does protrude well on to the site and will need to be removed to accommodate the lots there. Hedgerows H6 and H7, and the eastern edge of W3 will be preserved within the Moore Branch setbacks.

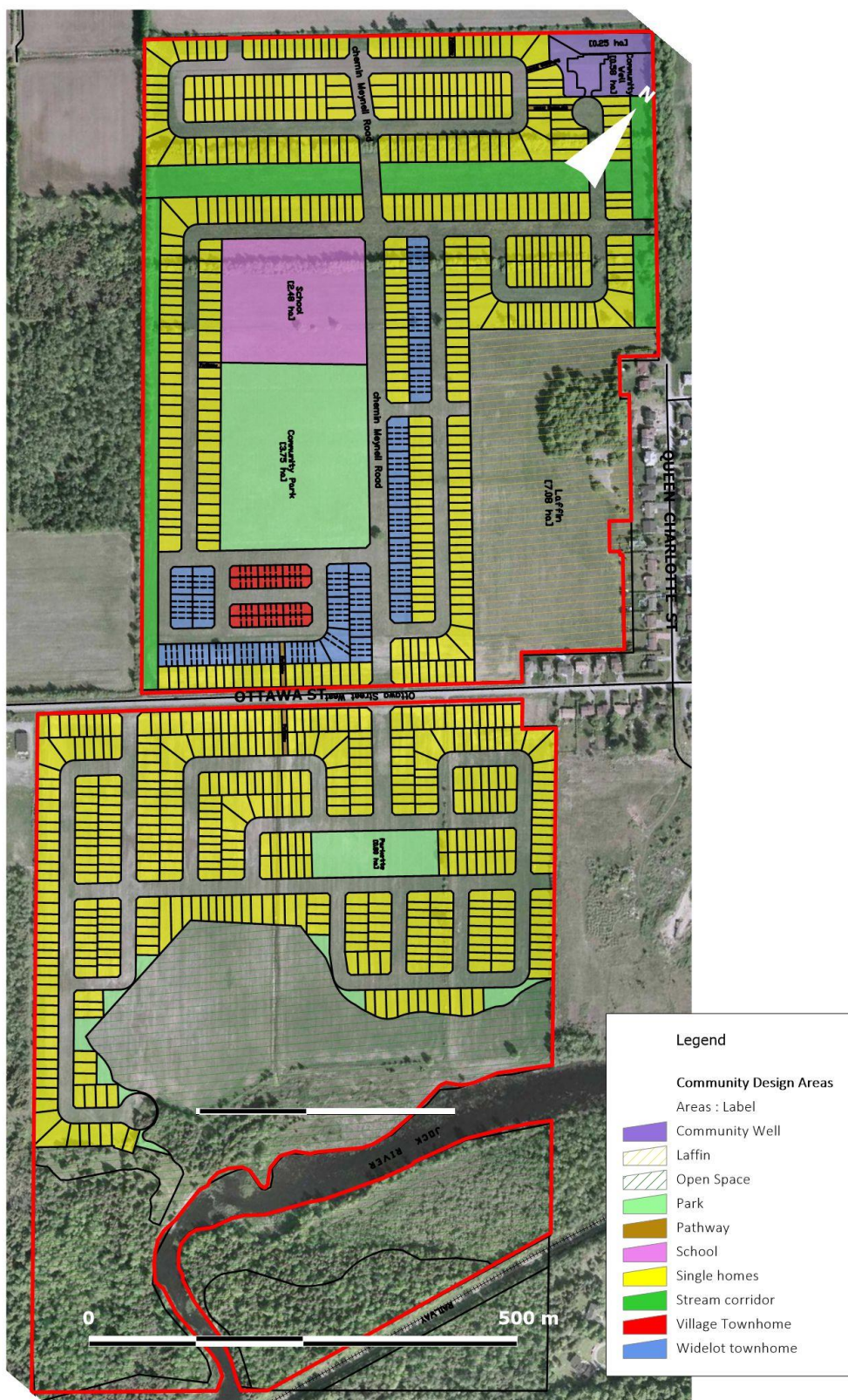
Hedgerow H4, along with 13 freestanding trees, will be removed to accommodate site grading and block layout. Hedgerow H3 will also be removed as the Moore Branch (i.e. VG-R3-2 Sections 6 and 7) will be realigned to cross the site 40 m to the south. The new channel will be reconstructed to allow for fish habitat improvements, especially with a grading design that will eliminate the central high point, thereby eliminating the upstream fish trap within the feature. H3 will be re-established with new trees along a broader (35 m wide) channel corridor as part of the new channel design. A line of 20 individual trees along the north edge of the property will also be removed, though the removal of these trees has already been addressed within the Tree Conservation Report filed for the neighbouring development.

Agricultural areas south of Ottawa St. and outside the Jock River floodplain will be developed with residential housing, with associated park space. Two Green Ash trees and a large ash snag will be removed from the center of the agricultural area. Several small clusters ash, Manitoba Maple, White Cedar, and Balsam poplar will be removed from north edge of the Community 10 Cultural Woodland and the western tip of the Community 8 ash forest grove to accommodate the south west corner of the residential development. The remaining Cultural Woodland strip will provide a 20-35 m buffer between the Marlborough forest NESS area and the residential development. Hedgerows H8 and H9 will be retained.

These both consist of trees either on or just outside of the property boundary and are unlikely to be impacted by grade raises tapering to existing edge grade.

Under the development proposal, current agricultural space within the Jock River floodplain will be converted to and maintained as open passive parkland. This conversion will have positive implications for grassland bird species discussed further below. This large swath of open parkland will provide a natural buffer 65-180 m in width between the residential development and the other existing natural areas (Communities 4 through 9) that form the Jock River wildlife corridor. These natural communities will remain unaltered.





**Figure 4. Proposed development layout.**



## **4.0 IMPACTS ASSESSMENT**

### **4.1 NESS Area**

#### **4.1.1 Potential Impacts**

Surface runoff from the existing agricultural areas north of the forest is currently drained by the JED-1 channel; the forest area is not dependent on surface flows from the agricultural area. Surface drainage from the new residential development will similarly be conducted away to the east such that no significant changes are expected with respect water or associated nutrient flows into the forest. Moreover, the Marlborough Forest NESS area will continue to be buffered from the surrounding area by the retention of the Community 10 cultural forest community. This buffer will intercept backyard runoff and botanical escapees from new residential lots, and provide the same level of tree screening as currently mitigates edge effects within the forest proper. With no change in location of the forest edge, the amount of interior forest space currently present will be unchanged. NESS 422 had previously extended northward toward Ottawa St. adjacent to the western edge Mattamy's site. This area has been converted to large residential lots. No significant negative impacts are expected to the remaining NESS forest area.

#### **4.1.2 Mitigation/Monitoring**

Standard mitigation measures relating to construction timing and practices as outlined below regarding on site wildlife, avifauna, fish and fish habitat will be sufficient to protect the Marlborough Forest during construction.

The Community 10 cultural forest will continue to provide an ecological buffer between the forest and forest anthropogenic activity, though conversion to residential space from agriculture will lead to increased human presence north of the buffer. It is strongly recommended that backyards abutting this area, and along hedgerow H8, have contiguous wood fencing with no gates permitted to minimize direct human entry to and through the buffer.

### **4.2 Jock River Corridor**

#### **4.2.1 Potential Impacts**

Under the proposed development, existing natural areas that form the Jock River wildlife corridor will remain unaltered. This corridor is currently directly bordered by active agriculture. The conversion of the adjacent agricultural space to passive parkland will provide an improved natural buffer with significant open meadow space (9.4 ha), improving both grassland bird habitat and as a wildlife corridor width.

JED-1 currently directs agricultural and neighbourhood (from the Jockvale Estates area) surface runoff into Communities 4-6 with no treatment. The removal of this channel will remove a potential pollution point source. Loss of water inputs are considered inconsequential. The natural communities, being riparian wetlands within the Jock River riparian flood plain, are kept wet by the river, not by the channel, which runs dry in summer.

This development is expected to provide a net positive impact on Jock River corridor.

## **4.2.2 Mitigation/Monitoring**

Maintenance requirements for the passive parkland area are discussed below in section 4.3.2.

A lightly used walking path currently runs through the Community 4 meadow marsh. The number of pedestrians visiting the area is likely to increase. A permanent path located within or along the south edge of the open park space will serve to direct foot traffic, containing it somewhat to limit soil compaction and disturbance in the softer, wetter soils of the current natural corridor areas. Locating the western terminus of the any pathway at the proposed turning circle in the south west corner of the development may help direct people away from the NESS forest area.

## **4.3 Species at Risk**

### **4.3.1 Potential Impacts**

Two at-risk species, Bobolink and Butternut, have been directly observed on Mattamy's Richmond property. A third species, Eastern Meadowlark, was heard in the area one time in 2008, though has not been observed. While the ongoing presence of Eastern Meadowlark may be uncertain, any habitat risks and/or provisions of Mattamy's development for this species would be the same as those for Bobolink, given both birds have similar requirements.

Two bat species, Little Brown Bat and Eastern Pipistrelle, an additional bird species, Barn Swallow, may also have some possibility of presence.

### **Birds**

The agricultural areas along Ottawa St. have historically been, and continue to be, planted with soy and/or corn crops. Areas cropped with corn or soy are not suitable for Bobolink (COSEWIC 2010). Bobolink did occur opportunistically on the site where, and during the instance when, a portion of the southern fields were temporarily left fallow. Most years however, the entire agricultural area was/is under active crop thus providing no suitable habitat. The small meadow marsh natural areas along the Jock River Corridor (Communities 4 and 5) did not provide significant Bobolink habitat as the very tall and dense Reed Canary Grass appears to be somewhat unappealing to the birds. Given the ongoing active agriculture, there is currently no significant habitat for grassland birds present on the site.

The passive parkland that will be created between the development and the Jock River has the potential to create nesting habitat for grassland birds including Bobolink. As such no negative impacts are anticipated to Bobolink under the proposed development and the passive parkland would represent a net benefit (though the active pursuit of that benefit would not specifically be required by the *ESA* in this case, i.e. with no negative impacts).

While Barn Swallows were not observed during any of original bird surveys, they can feed over active agricultural areas. Thus the ongoing presence of soybean crops on area fields, especially those nearest the Jock River, does not preclude habitat potential there the same it does for Bobolink. Only portions i=of those fields however, that are within 200 m of active nests are subject to protection under the *ESA*, and no nest supporting structures are located directly on Mattamy owned lands.

Prior to proceeding with development, if surveys nesting surveys observe the presence of Barn Swallow nests within 200 m of existing open areas proposed to be developed, the MNRFs' site registration process will allow development to proceed but will oblige Mattamy to provide a net benefit for the species. (and does detail the measures to be completed to do so). The open space of the passive parkland areas would provide suitable feeding space for Barn Swallows, though that species would be more generally be expected to feed closer to or directly over the river regardless. If the species is found nesting near development lands, new nesting structures there, as per a site registration, would ensure no negative impacts for this species.

### **Butternut**

Only three Butternut trees have been observed on this property during all field investigations. These trees are located within the Marlborough Forest NESS area in the very south-west corner of the site. All are located over 100 m south of any development activity (Figure 2). None were found on or adjacent to development areas during the 2017 check of site tree. As such, no negative impacts are expected for this species.

### **Bats**

Two bat species have some limited possibility of presence on site. Habitat areas for these species however, if present, would be roosting areas within forested ecosites, adjacent to open areas for optimal feeding. The proposed Mattamy development plan retains all forest areas on site as well as the open spaces adjacent to them. As such, no negative impacts are expected for this species.

## **4.3.2 Mitigation/Monitoring**

### **Birds**

While cropped areas are not recognized as habitat for Bobolink or Meadowlark, it is not impossible (though it still is highly improbable) that a nest could occur within a grassy patch of the farm field. To ensure the safety of individuals of the two species, no construction or other development activities should occur within the fields adjacent to Ottawa St. between April 15 and August 15 without first ensuring the absence of grassland bird nests during that period. If any at-risk bird species are nesting in these areas, construction must be delayed until such time as all nestlings are fledged.

A nesting survey for Barn Swallows must be performed of all area within 200 m of Mattamy's lands south of Ottawa St. during the summer period immediately prior to the commencement of land development there. If Barn Swallows nest are observed, the site must be registered with the MNRF. The site registration will oblige Mattamy to construct compensatory habitat following MNRF guidelines and based on the number of active Barn Swallow nests noted. Nesting structures would then be built near the open parkland as part of that area's development. Annual inspections of the nesting compensation structure must be completed for three years. Additionally, a Barn Swallow Mitigation and Restoration Record must be created and maintained before the removal of any Barn Swallow nest and be maintained for two years after the end of monitoring. The MNRF can quest to review this record at any time. Site registration is a proponent initiated and managed process that otherwise requires no direct input or response from the MNRF. The proponent must complete the registration process and abide by the rules and obligations

imposed by the registration, but does not otherwise require any permit from or interaction with the MNRF to proceed with development.

### **Butternut**

Any earthworks or other development activities potentially destructive to Butternut commencing after December 2019 must be preceded by an investigation of the area for Butternut by a qualified biologist. As no Butternuts are currently present within these areas, any subsequently noted trees would be small and few in number, thereby allowing for a simple site registration process with the MNRF. The proponent must complete the registration process and abide by the rules and obligations imposed by the registration, but does not otherwise require any permit from or interaction with the MNRF to proceed with development.

## **4.4 Trees and Treed Areas**

Where possible, Mattamy has attempted to incorporate existing trees as per grading and community design. Accordingly, hedgerows H5, H6, H7, H8 and H9, as well as the eastern edge of woodlot W3 will be retained. Hedgerow H3 will be removed during site development but will be replaced with new trees. Hedgerow H4, the Community 2 wooded area, 16 freestanding trees, and several small clusters ash, Manitoba Maple, White Cedar, and Balsam poplar from the north edge of the Community 10 Cultural Woodland and the western tip of the Community 8 ash forest will be removed. All other trees within the Jock River corridor, including the Marlborough forest NESS area will be preserved.

The resurveying of the trees on site in December, 2017 found that EAB was widespread on site. Almost all ash within H3 and H4 and the free standing ash trees on site were observed to be sick and dying from EAB. Because of EAB, the removal of these hedgerows and freestanding trees will not impact the ecological value of forests on site.

The following measures are recommended to offset the lost trees:

1. Hedgerow 3 will be re-established in some manner within a 35 m wide corridor for the Moore Branch. The current hedgerow is a tight line of trees approximately 5 m in width, though as all of the ash trees there are dead or dying, this diminishing. Trees planted through this new corridor are not required to form a similarly linear feature, but must be planted (and/or allowed to spread) throughout the corridor in pattern with sufficient density to shade the water feature. A pathway may through the corridor could be permissible so long 1) as it is outside of the channel's meander belt (which would be engineered as part of the channel design), and 2) it allows for sufficient tree density as indicated above.
2. To minimize impact to remaining trees on site during construction the following protection measures for retained trees will be implemented:
  - Erect a fence at the critical root zone (CRZ, i.e. 10 x the trunk diameter) of trees;
  - Do not place any material or equipment within the CRZ of the tree;
  - Do not attach any signs, notices or posters to any tree;

- Do not raise or lower the existing grade within the CRZ without approval;
  - Tunnel or bore when digging within the CRZ of a tree;
  - Do not damage the root system, trunk or branches of any tree;
  - Ensure that exhaust fumes from all equipment are NOT directed towards any tree's canopy.
3. Specific trees to be planted on site will be identified in the landscape plan for the development. Trees species identified in this plan should be non-invasive and should be native to the Ottawa area. Landscaping plans should consider species such as White Pine, Basswood, Sugar Maple, White Spruce, Pin Cherry, White Birch, Black Cherry, and White Cedar where conditions may now permit. Burr Oak may be considered where spacing allows for future showcase trees. Common Juniper, Service Berry, and Northern Bush-honeysuckle may be considered as appropriate shrub species. Trees must be planted to a density equivalent to at least one per unit, though the distribution of specific planting locations may be varied from necessarily planting on every lot, as may be dictated by individual lot considerations.
4. Two additional park spaces (total area 4.5 ha, Figure 4) will be created within the current agricultural areas. The landscape plan must include additional tree planting within these areas.

The above mitigations will preserve most of the existing trees on site and will result in an overall increase in the density of mature native trees over the currently nearly treeless agricultural areas and within other open spaces as may be accommodated by their final configuration.

## **4.5 Fish and Fish Habitat**

### **4.5.1 Anticipated Impact**

The proposed development will result in the loss of some 450 lineal m (1350 m<sup>2</sup>) of intermittent direct fish habitat within JED-1 and the associated road side ditches along Ottawa St. This habitat is considered to be of low sensitivity on the basis of a general absence of fish during the autumn period, the dry period in the summer, and the highly limited fish numbers and species in the spring. The scale of the negative effect is considered to be high because the ditch will be permanently moved, and the spatial extent of the impact is complete (on the property). The ditch does not present unique or unusual habitat. Indeed, each of the species found in this ditch could utilize other ditches, or more downstream and natural watercourses to complete their lifecycle requirements.

The habitat provided by the ditch system can be easily re-produced elsewhere given that the ditch is mostly man-made conveying water through agricultural fields to a downstream water course, and are low-quality environments for fish. There are no unique habitats provided by these ditch features that would be difficult to re-create. Further, the species that inhabit the feature are all species that are well distributed and well able to colonize new aquatic habitats. None of the species in the ditch feature have unique habitat requirements that are difficult to recreate.

Channel improvements, i.e. the removal of the high spot isolating sections 7 and 8 of the VG-R3-2 reach of the Moore Branch, are expected to convert 968 lineal m (3285 m<sup>2</sup>) of indirect fish habitat to intermittent direct habitat. Thus this development will provide a net gain of 1935 m<sup>2</sup> of fish habitat.

The new channel will be located within a corridor that is 35 m wide. The corridor provides 15 m of riparian space on either side (i.e. from top of bank). This is smaller than 30 m from the NHWM, but is larger than the current meander belt width (30 m total corridor – KAL, Parish & Mattamy 2010) is much larger than the current actual corridor of ~5 m width and, as such, is deemed sufficient to protect the ecology of the channel.

#### **4.5.2 Mitigation/Monitoring**

The new channel form will not necessarily follow natural channel design, but it must not be a fully linear, uniform channel with one long run. The corridor provides for channel alignment within 5 m width (i.e. twice the current width). This provides some opportunity, for final channel designs to include some morphological variability such as (limited) riffle/pool sequencing and the additional of structural elements such as occasional sweepers and boulders.

Mattamy will require a permit from the RVCA for the alteration of a waterway for the removal of JED-1, and for the realignment of VG-R3-2. The RVCA does not require an HDFA to support the permit application as the work done to date through the NEIA (KAL, Parish & Mattamy 2010) provides the relevant existing conditions information. The work is unlikely to require a Fisheries Authorization from DFO though this must be confirmed through a Request for Review. The Request for Review process will either lead a Letter of Advice or necessitate a Fisheries Authorization. Mattamy must abide by the conditions whichever of these is ultimately issued.

#### **4.6 Other Wildlife and Avifauna**

Common wildlife species are likely to use the site. The following mitigation measures shall be implemented during construction of the project on site:

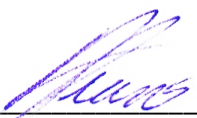
- Areas shall not be cleared during sensitive time of the year for wildlife, unless mitigation measures are implemented and/or the habitat has been inspected by a qualified biologist.
- Site clearing should begin at the north end of the site and proceed southward to drive wildlife towards the large forest.
- Do not harm, feed, or unnecessarily harass wildlife.
- Food wastes and other garbage – effective mitigation measures include waste control (prevent littering); keeping all trash secured in wildlife-proof containers, and prompt removal from the site (especially in warm weather).
- Drive slowly and avoid hitting wildlife where possible.
- Shelter – effective mitigation measures include covering or containing piles of soil, fill, brush, rocks and other loose materials; capping ends of pipes where necessary to keep wildlife out; ensuring that trailers, bins, boxes, and vacant buildings are secured at the end of each work day to prevent access by wildlife.

- Checking the work site (including previously cleared areas) for wildlife, prior to beginning work each day;
- Inspecting protective fencing or other installed measures daily and after each rain event to ensure their integrity and continued function; and,

Monitoring construction activities to ensure compliance with the project-specific protocol (where applicable) or any other requirements.

## **5.0 SUMMARY AND RECOMMENDATIONS**

Following the mitigations as outlined in this report, it is my professional opinion that no significant impacts to species-at-risk or sensitive lands along the Jock River are anticipated from this project.



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Anthony Francis, PhD

KILGOUR & ASSOCIATES LTD.

## **6.0 REFERENCES**

Kilgour & Associates Ltd., Parish Geomorphic & Mattamy Homes Ltd. (KAL, Parish & Mattamy), 2010.  
Natural Environment & Impact Assessment Study. February 2010.

Kilgour & Associates Ltd. 2013. Environmental Impact Statement and Tree Conservation Report –  
Mattamy Richmond. Final Report. April 4, 2013.



**Appendix 1**  
**Qualifications of Report Authors**

**Anthony Francis, PhD**

Dr. Francis is an ecologist with over 18 years of experience in both terrestrial and aquatic projects. His doctoral thesis work on global plant diversity patterns included conducting tree surveys across North America. As a consulting ecologist he has worked on diverse ecological projects including literature reviews of forestry management and species-at-risk; environmental studies of contaminants (metals and suspended particulates); geomatic and statistical analyses for federal and provincial ministries as well as for private industry; and aquatic and terrestrial species inventories. He has contributed to environmental impact statements and federal environmental screening assessments for creek realignments and other infrastructure projects across Ontario.