

Environmental Impact Study

JACK CRESCENT TO GOODFELLOW PUBLIC SCHOOL TRAIL, TOWN OF INNISFIL, ONTARIO

prepared for:



prepared by:



OCTOBER 2019



JACK CRESCENT TO GOODFELLOW PUBLIC SCHOOL TRAIL INNISFIL, ONTARIO

ENVIRONMENTAL IMPACT STUDY

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OCTOBER 2019

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1.0 INTRODUCTION

The Town of Innisfil proposes to construct a recreational trail to connect Jack Crescent with Goodfellow Public School in the Alcona Settlement Area. The recreational trail is being designed by IBI Group and LGL Limited is providing natural heritage services as a sub-consultant to IBI Group. The purpose of this report is to support an application for a permit under Ontario Regulation 179/06, Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation, administered by the Lake Simcoe Region Conservation Authority (LSRCA) under Section 28 of the *Conservation Authorities Act*. The location of the proposed trail is shown in **Figure 1**. The study area extends from Jack Crescent to Goodfellow Public School, a distance of close to 100 m, including 50 m on each side of the trail as shown in **Figure 1**.

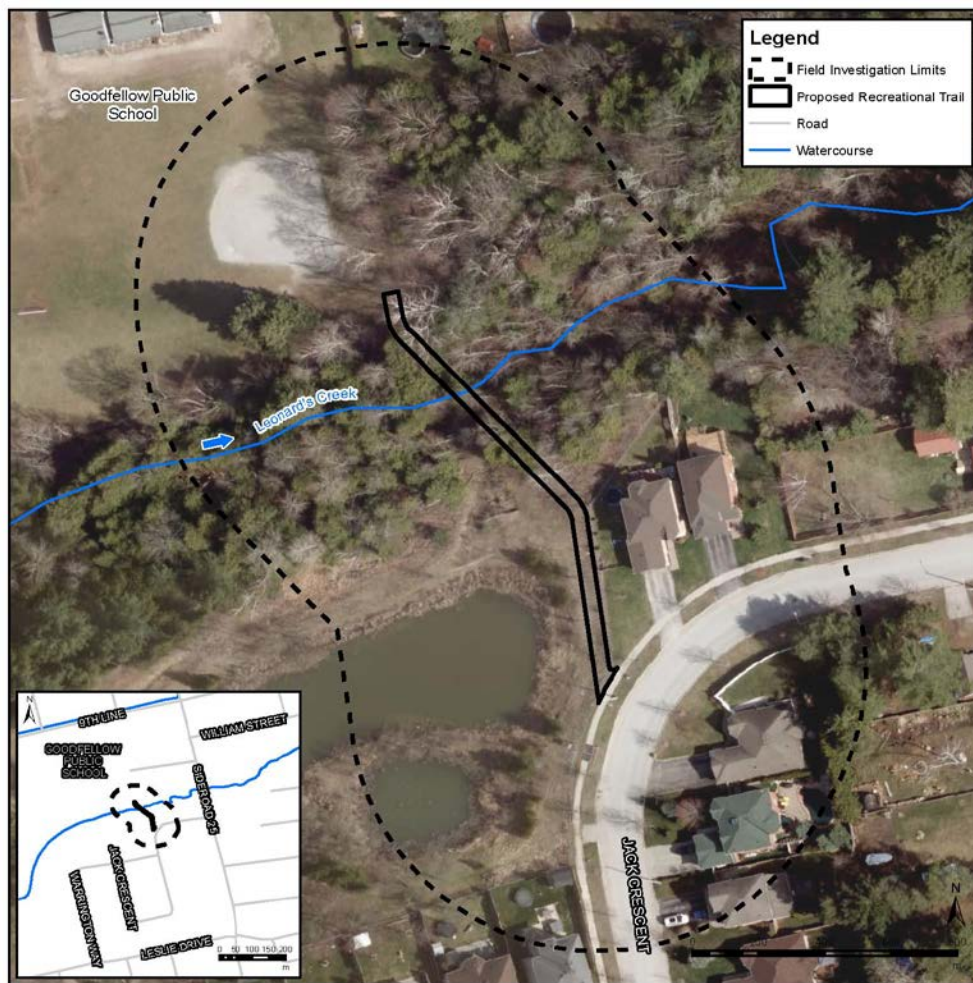


FIGURE 1. PROPOSED LOCATION OF JACK CRESCENT TO GOODFELLOW PUBLIC SCHOOL TRAIL

2.0 SITE DESCRIPTION

The site of the proposed trail is designated as Key Natural Heritage Features & Key Hydrological Features in Schedule B1 Land Use: Alcona in the Town of Innisfil Official Plan. The site is bordered by Community Space (Goodfellow Public School) and Residential Low Density 1 to the north and Residential Low Density 1 to the south. The Hazard Land Area Overlay also covers the site.

The site is identified as Significant Woodland and a Provincially Significant Wetland according to the Ministry of Natural Resources and Forestry “Make a Map” mapping tool. The site lies within a Regulated Area according to the Lake Simcoe Region Conservation Authority Ontario Regulation 179/06 mapping tool. Designated natural heritage features are presented in **Figure 2**.

2.1 PHYSIOGRAPHY, BEDROCK AND QUATERNARY GEOLOGY

The site is located within the Simcoe Lowlands physiographic region (Chapman and Putnam 1984). The Simcoe Lowlands were flooded by glacial Lake Algonquin, are relatively flat and contain sand, silt and clay deposits. Bedrock consists of the Simcoe Group, which is Middle Ordovician in age, and comprised of limestone (Ontario Geological Survey 1991). Quaternary geology consists of littoral foreshore deposits (Barnett, Cowan and Henry 1991). The site is mostly level, with a slight trend towards Leonard’s Creek from the north and south.

2.2 FISHERIES

The site is located within the Innisfil Creeks subwatershed, more specifically Leonard’s Creek. Leonard’s Creek is 15 km in length and supports a primarily coldwater fish community. Leonard’s Creek is considered an urban watercourse, since much of the stream is located in the community of Alcona. Leonard’s Creek originates near 20th Sideroad and flows easterly through the Leonard Wetland Complex to Goodfellow Avenue, where it turns south abruptly and enters Lake Simcoe south of the Crystal Beach Road/Goodfellow Avenue intersection. This watercourse is under the jurisdiction of Lake Simcoe Region Conservation Authority (LSRCA) and the Ministry of Natural Resources and Forestry (MNRF) Midhurst District.



LEGEND

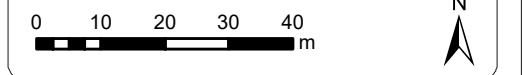
-  Anuran Monitoring Station
-  Breeding Bird Point Count Station
-  Proposed Watercourse Crossing
-  Watercourse - Cool Thermal Regime
-  Proposed Recreational Trail
-  Wetland Evaluated - Provincial
-  Wooded Area
-  Regulated Area (LSRCA)*
-  Floodplain (LSRCA)

- Vegetation Communities**
-  Vegetation Community Boundary
 - CUM-1** Dry-Moist Old Field Meadow Type
 - FOM** Mixed Forest
 - SWC1-1** White Cedar Mineral Coniferous Swamp Type

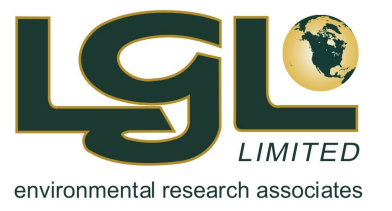
* NOTE: Regulated Area is located north of the white hatched line.

Data Sources: Lake Simcoe Region Conservation Authority & Town of Innisfil & Ontario Ministry of Natural Resources and Forestry (LIO).

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NATURAL HERITAGE/
EXISTING CONDITIONS



Project: TA8917	Figure: 2
Date: October, 2019	Prepared By: JJP
Scale: 1 : 1,000	Checked By: GNK

2.2.1 Background Data

LGL conducted a secondary source review to identify the fish community within the watercourse. The secondary source review included a species at risk screening through aquatic species at risk mapping (DFO 2019) and the Natural Heritage Information Centre (NHIC) database (MNR 2019). Background review also included; correspondence with the MECF regarding species at risk and fish collection records (September 20, 2019); correspondence with the LSRCA regarding fish sensitivity and fisheries collection records within the study area (September 27, 2019); and correspondence with the Town of Innisfil (October 1, 2019) (see **Table 1**). LGL also reviewed the Innisfil Creeks Subwatershed Plan (LSRCA 2012).

According to background investigations, there is no regulated habitat for aquatic species at risk and no species at risk were recorded in the study area (DFO 2019). Secondary source data from the MNR Natural Heritage Information Centre (NHIC) was reviewed to screen for the presence or absence of wildlife species at risk within or adjacent to the study area. The NHIC database indicated that no species at risk have historically been found in the vicinity of Leonard's Creek within the study area. Furthermore, fish collection records were received from LSRCA (2019) from two monitoring stations nearest the study site, approximately 500 m upstream from the crossing and approximately 150 m downstream from the crossing, at which no species at risk were found.

2.2.2 Field Investigations

LGL fisheries specialists visited the site between Goodfellow Public School and Jack Crescent on June 14, 2019 to observe and document existing aquatic habitat conditions. The weather conditions during the site visit were sunny, 22°C, with winds at 44 km/h out of the northwest. Fish habitat was assessed approximately 50 m upstream and 100 m downstream of the crossing, where access was permitted. Physical habitat features were surveyed in sufficient detail to enable mapping and identification of key habitat types. The physical habitat attributes assessed included: (a) instream cover, (b) bank stability, (c) substrate characteristics, (d) stream dimensions, (e) barriers, (f) stream morphology, (g) terrain characteristics, (h) stream canopy cover, (i) stream gradient, (j) aquatic vegetation, (k) ground water seepage areas, and (l) general comments. **Figure 2** presents the location of the proposed crossing identified within the study area. An aquatic habitat summary is presented below which describes existing conditions at the watercourse crossing. Representative photographs of the crossing were also taken during investigations and are provided in **Appendix A**.

**TABLE 1:
HISTORICAL FISH COLLECTION RECORDS WITHIN THE STUDY AREA**

Scientific Name	Common Name	Leonard's Creek	COSEWIC	SARA	MNRF
<i>Lethenteron appendix</i>	Blacknose Shiner	y, z	-	-	-
<i>Pimephales notatus</i>	Bluntnose Minnow	y, z	-	-	-
<i>Culaea inconstans</i>	Brook Stickleback	y, z	-	-	-
<i>Umbra limi</i>	Central Mudminnow	y, z	-	-	-
<i>Luxilus cornutus</i>	Common Shiner	y, z	-	-	-
<i>Semotilus atromaculatus</i>	Creek Chub	y, z	-	-	-
<i>Rhinichthys atratulus</i>	Blacknose Dace	y	-	-	-
<i>Notropis atherinoides</i>	Emerald Shiner	y, z	-	-	-
<i>Pimephales promelas</i>	Fathead Minnow	y, z	-	-	-
<i>Chrosomus neogaeus</i>	Finescale Dace	y, z	-	-	-
<i>Notemigonus crysoleucas</i>	Golden Shiner	y	-	-	-
<i>Micropterus salmoides</i>	Largemouth Bass	y	-	-	-
<i>Rhinichthys cataractae</i>	Longnose Dace	y, z	-	-	-
<i>Notropis volucellus</i>	Mimic Shiner	y	-	-	-
<i>Cottus bairdii</i>	Mottled Sculpin	y, z	-	-	-
<i>Margariscus nachtriebi</i>	Northern Pearl Dace	y	-	-	-
<i>Chrosomus eos</i>	Northern Redbelly Dace	y, z	-	-	-
<i>Lepomis gibbosus</i>	Pumpkinseed	y, z	-	-	-
<i>Ambloplites rupestris</i>	Rock Bass	y, z	-	-	-
<i>Notropis rubellus</i>	Rosyface Shiner	y	-	-	-
<i>Micropterus dolomieu</i>	Smallmouth Bass	y	-	-	-
<i>Cyprinella spiloptera</i>	Spotfin Shiner	y	-	-	-
<i>Catostomus commersonii</i>	White Sucker	y, z	-	-	-
<i>Perca flavescens</i>	Yellow Perch	y	-	-	-

Note: y = LSRCA Collection Data (2009 – 2018)

z = Secondary Sources; Innisfil Creeks Subwatershed Plan (2012)

*Refer to Appendix C for Acronyms, Definitions used in the Species List

2.2.3 Leonard's Creek

The recreational trail will cross Leonard's Creek. The watercourse is situated at the bottom of a shallow, forested valley that runs through the Leonard's Beach Swamp Provincially Significant Wetland (PSW). Leonard's Creek is a permanently flowing watercourse classified as a coldwater stream by the LSRCA (LSRCA 2012) and a coolwater stream by MNRF. It is likely that thermal degradation is occurring within this watercourse as upstream temperature gauges indicate a coldwater thermal regime, but

subsequent gauges downstream indicate that the watercourse has a coolwater thermal regime (LSRCA 2012).

During the June 14, 2019 site visit, water in the upstream portion of the channel was found to be flowing at a constant rate. The watercourse is riffle/run-dominated with multiple pools observed, particularly at meander bends or downstream of large woody debris (LWD) jams. The wetted width of the channel ranges from 1.5 m to 3 m, and depth ranges from 10 cm to 40 cm. Pool depth ranges between 20 cm to 60 cm, and pool widths range from 1 m to 2 m. Bankfull width is estimated to be 3.5 m and bankfull depth to be 75 cm. Instream cover is abundant and provided by undercut banks and instream woody debris. Riparian vegetation is dense, consisting of deciduous trees and shrubs. Substrates are comprised mainly of sand, gravel and small cobbles. Additional flow is contributed from a storm water outfall via a corrugated steel pipe (CSP) located at the boundary of the Goodfellow Public School property, approximately 20 m upstream from the proposed crossing. Pockets of standing water and wet soil were observed adjacent to the watercourse; however, no visible flow was contributing to the channel at the time of the site visit.

A small channel, originating from two storm water management ponds located north of Jack Crescent, flows into Leonard's Creek approximately 5 m upstream of the proposed crossing. The depth of these ponds is unknown; however, the pond closest to Jack Crescent is the smaller of the two and receives flow from the storm water management system of the subdivision adjacent to Jack Crescent via a concrete box culvert. The larger pond is poorly shaded and is surrounded by cultural meadow and cattails. Neither of these ponds are likely direct fish habitat due to their isolation from natural direct fish habitat (i.e., fish passage into the pond is not possible due to barriers); however, Goldfish (*Carassius auratus*), an invasive species, were observed in the larger pond during the site visit (likely released there by local residents). Flow is conveyed through two concrete box culverts; only one of which contained water. Flow from the western culvert forms a small channel, which was lined with concrete blocks, likely to prevent erosion. The channel was narrow (0.7 m wide) and shallow (10 cm deep), flowing over concrete blocks and mud substrate, with instream vegetation consisting of grasses, for approximately 25 m until it converged with Leonard's Creek. The concrete blocks extend beyond the confluence of this small channel and are exposed along the downstream right bank of Leonard's Creek.

Downstream of the proposed crossing the morphology changes as the channel becomes slightly narrower and meanders become less frequent. The wetted channel dimensions in this section range between 1 m to 1.5 m in width and 10 cm to 50 cm in depth. Bankfull width is estimated to be 2.5 m and bankfull depth to be 60 cm. Banks are undercut and a few pools were observed in these areas, with an average depth of 60 cm and width of 0.5 m. Instream cover consists of grasses and a substantial amount of large woody debris (LWD), which was observed to restrict flow causing one large pool (4 m wide and 60 cm deep). Riparian vegetation cover dominating the banks consists of mostly ferns and shrubs. Approximately 40 m downstream of the proposed crossing riparian vegetation becomes denser, consisting of large overhanging deciduous trees and shrubs, which provide ample shading to the watercourse. Substrates consist of sand and gravel. Along the bottom of the slope, approximately 60 m downstream of the proposed crossing, a potential remnant channel was observed that was not flowing during the site visit. Human debris was observed in multiple locations downstream of the proposed crossing; removal is recommended as debris may impact channel geomorphology.

Although no fish were observed during the June 14, 2019 site visit, it was concluded that the watercourse supports direct fish habitat. Multiple LWD jams, pools, and undercut banks provide areas of refuge for fish and aquatic invertebrates. As Leonard's Creek is a coldwater thermal regime watercourse, it is likely that species preferring cooler temperatures would inhabit this watercourse.

2.2.4 Species at Risk

As stated above, based on a review of the MNR Natural Heritage Information Centre database, DFO Species at Risk mapping, and correspondence with LSRCA, no aquatic species at risk occur within the study limits between Goodfellow Public School and Jack Crescent.

2.3 VEGETATION

2.3.1 Purpose

The geographical extent, composition, structure and function of vegetation communities were identified through air photo interpretation and field investigations. Air photos were interpreted to determine the limits and characteristics of vegetation communities. A field investigation of the vegetation communities within the study area and beyond to the extent possible, was undertaken on June 14, 2019.

Vegetation communities were classified according to the *Ecological Land Classification for Southern Ontario: First Approximation and Its Application* (Lee *et al.* 1998). The communities were sampled using a plotless method for the purpose of determining general composition and structure of the vegetation. Plant species status was reviewed for Ontario (Oldham 2009) and Simcoe County (Riley 1989). Vascular plant nomenclature follows Newmaster *et al.* (1998) with a few exceptions that have been updated to Newmaster *et al.* (2007).

A total of three ELC community types were identified within the study area during LGL's botanical surveys including: Dry-Moist Old Field Meadow (CUM1-1); Mixed Forest (FOM); and, White Cedar Mineral Coniferous Swamp (SWC1-1). Vegetation communities identified in the study area are described in **Table 2** and presented in **Figure 2**. All of the vegetation communities within the study area are considered widespread and common in Ontario and are secure globally.

Natural/semi-natural features within the study area are comprised of a large coniferous swamp and mixed forest that extends beyond the study area. The coniferous swamp community is largely dominated by eastern white cedar (*Thuja occidentalis*) with wetland obligate species on the ground and is associated with the Leonard's Beach Swamp Provincially Significant Wetland (PSW) complex. The mixed forest community is comprised of a mixture of hardwood and coniferous tree species. An existing *ad hoc* path is present within the swamp and forest communities.

The southern portion of the study area is comprised of a large cultural meadow community associated with a stormwater management pond. In general, cultural meadow communities typically persist in areas that are regularly disturbed, and as a result, generally contain a high proportion of invasive and non-native plant species that are disturbance tolerant.

TABLE 2.
SUMMARY OF ECOLOGICAL LAND CLASSIFICATION VEGETATION COMMUNITIES

ELC Code	Vegetation Type	Species Association	Community Characteristics
TERRESTRIAL – NATURAL/SEMI-NATURAL			
FOM	Mixed Forest		
FOM	Mixed Forest	<p>Canopy: includes trembling aspen (<i>Populus tremuloides</i>), eastern white cedar (<i>Thuja occidentalis</i>) basswood (<i>Tilia americana</i>), and Manitoba maple (<i>Acer negundo</i>).</p> <p>Understory: includes common buckthorn (<i>Rhamnus cathartica</i>), alternate-leaved dogwood (<i>Cornus alternifolia</i>), and eastern white cedar.</p> <p>Ground cover: includes royal fern (<i>Osmunda regalis</i> var. <i>spectabilis</i>), red baneberry (<i>Actea rubra</i>), purple flowering raspberry (<i>Rubus odoratus</i>), spreading dogbane (<i>Apocynum androsaemifolium</i> ssp. <i>androsaemifolium</i>).</p>	<ul style="list-style-type: none"> • Tree cover > 60 % (FO). • Coniferous trees > 25 % and deciduous trees > 25% of canopy cover (M).
SWC	Coniferous Swamp		
SWC1-1	Mineral Cedar Mineral Coniferous Forest	<p>Canopy: includes eastern white cedar, trembling aspen and balsam poplar (<i>Populus balsamifera</i>).</p> <p>Understory: includes eastern white cedar, and red osier dogwood (<i>Cornus stolonifera</i>).</p> <p>Ground cover: includes spotted-touch-me-not (<i>Impatiens capensis</i>), sensitive fern (<i>Onoclea sensibilis</i>), lake-bank sedge (<i>Carex lacustris</i>), and water-cress (<i>Nasturtium officinale</i>).</p>	<ul style="list-style-type: none"> • Tree or shrub cover >25% and dominated by hydrophytic shrub and tree species (SW). • Coniferous tree cover >75% of canopy cover (C). • Cedar dominant (1). • Mineral soil (-1).
TERRESTRIAL – CULTURAL			
CUM	Cultural Meadow		
CUM1-1	Dry-Moist-Old Field Meadow	<p>Emergent trees/shrubs: includes eastern white cedar, red osier dogwood and smooth juneberry (<i>Amelanchier laevis</i>).</p> <p>Ground cover: includes wild carrot (<i>Daucus carota</i>), common milkweed (<i>Asclepias syriaca</i>), Canada thistle (<i>Cirsium arvense</i>), and chicory (<i>Cichorium intybus</i>).</p>	<ul style="list-style-type: none"> • Cultural communities (CU). • Tree cover and shrub cover < 25 % (M). • Mineral soil (1).

2.3.2 Flora

A total of 89 plant species have been recorded within the study area. Three of these plants could only be identified to genus and are not included in the following calculations. Of the 86 plants identified to species, 54 (63%) plant species identified are native to Ontario and 32 (37%) plant species are considered introduced and non-native to Ontario. A list of vascular plants is presented in **Appendix B**. Definitions of the acronyms and species ranks used in **Appendix B** are described in **Appendix C**.

2.3.3 Species at Risk

No plant species that are regulated under the Ontario *Endangered Species Act* or the Canada *Species at Risk Act* were encountered during LGL's botanical investigation. A review of the MNRF Natural Heritage Information Centre (2019) indicates that there are no historic records of plant species at risk within the study area.

One plant species considered rare in Simcoe County was identified during LGL's botanical field investigation. Purple flowering raspberry (*Rubus odoratus*) is considered regionally rare and was identified within the mixed forest community.

2.3.4 Designated Natural Areas

Designated natural areas include areas identified for protection by the Ontario Ministry of Natural Resources and Forestry (OMNRF), LSRCA, Town of Innisfil and Simcoe County. A review of the MNRF NHIC database indicates that there are no Areas of Natural and Scientific Interest (ANSIs), or Environmentally Sensitive Areas (ESAs) located within 120 m of the study area. A portion of the Leonard Beach PSW is within the study area and is associated with the coniferous swamp community.

2.3.5 Tree Resources

An ISA Certified Arborist conducted an inventory of tree resources on June 14, 2019. The tree survey was undertaken within and up to 20 m beyond the proposed Goodfellow Trail location. All trees 10 cm diameter at breast height (DBH) were surveyed. The following was completed for each tree:

- Species identification, including screening for species regulated by the Ontario *Endangered Species Act, 2007* (ESA);
- Measurements: diameter at breast height (DBH) and estimation of canopy dripline;

- Location: trees were assigned a numerical identifier using metal tags and their locations recorded by an Ontario Land Surveyor; and;
- Health Assessment: trees were assessed as poor, fair or good based on qualities such as trunk integrity, crown structure, vigour, and dieback. Physical irregularities and defects were also noted for each tree.

A total of 215 trees were identified and assessed within the study area. Tree resources are summarized in **Appendix D** and the locations of each tree (by tree number) are presented in **Figures 3A to 3D**. Overall, trees within the study area range in size from 10 to 69 cm DBH and are generally considered to be in good to fair condition.

2.4 WILDLIFE

Field investigations within the study area were conducted on several dates in the spring and summer of 2019 to document wildlife and wildlife habitat and to characterize the nature, extent and significance of animal usage. Direct observations, calls, tracks, and scat were used to record wildlife present. A summary of survey date(s), tasks and weather is presented in **Table 3**.

TABLE 3.
SUMMARY OF DATE OF INVENTORY, TASK, WEATHER AND PERSONNEL





Date of Inventory	Task	Weather	Personnel Involved
May 10, 2019	Anuran survey	Partial cloud cover, 8C, calm	David Smith (LGL)
May 25, 2019	Anuran survey	Partial cloud cover, 21C, calm	David Smith (LGL)
June 7, 2019	Breeding Bird survey and incidental wildlife survey	Clear, 8C, calm	David Smith (LGL)
June 14, 2019	Anuran Survey	Clear, 19C, calm	David Smith (LGL)
July 7, 2019	Breeding bird survey and incidental wildlife survey	Partial cloud cover, 15C, calm	David Smith (LGL)



Goodfellow Public School

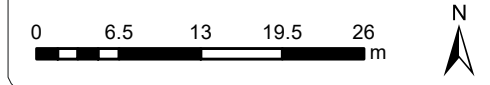
JACK CRESCENT

LEGEND

-  Tree (Surveyed)
-  Dead Tree (Surveyed)
-  Tree Tags 330-383 (Not Surveyed)
-  Proposed Boardwalk

Data Sources: LGL Limited field survey & Ontario Ministry of Natural Resources and Forestry (LIO).

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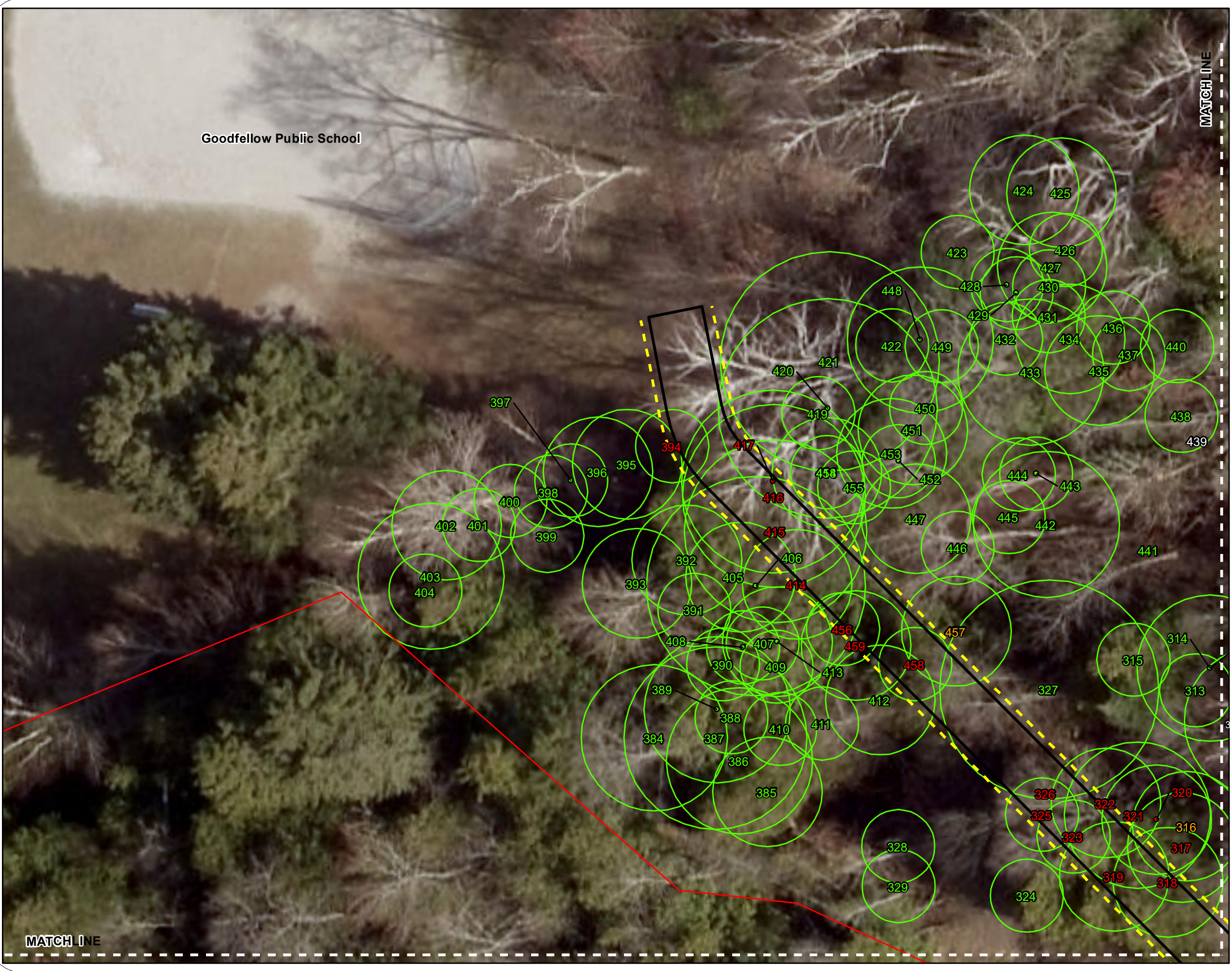
TREE RESOURCES



Project: TA8917	Figure: 3a
Date: October, 2019	Prepared By: JJP
Scale: 1 : 700	Checked By: LMC

Goodfellow Public School

MATCH LINE

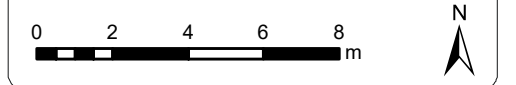


LEGEND

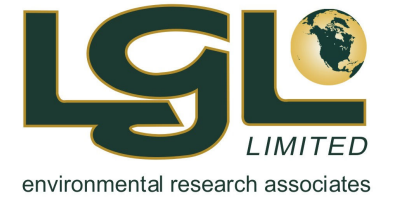
-  326 Dead Tree
-  425 Tree To Be Protected
-  316 Tree To Be Impacted
-  458 Tree To Be Removed
-  Dripline
-  Tree Protection Fence
-  Tree Tags 330-383 (Not Surveyed)
-  Proposed Boardwalk

Data Sources: LGL Limited field survey & Ontario Ministry of Natural Resources and Forestry (LIO).

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TREE RESOURCES PROTECTION AND REMOVALS



Project: TA8917	Figure: 3b
Date: March, 2020	Prepared By: JJP
Scale: 1 : 200	Checked By: LMC

MATCH LINE

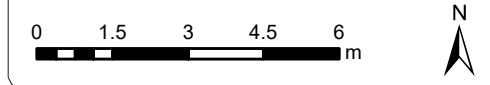


LEGEND

- 326 Dead Tree
- 425 Tree To Be Protected
- 316 Tree To Be Impacted
- 458 Tree To Be Removed
- Dripline
- Tree Protection Fence
- Tree Tags 330-383 (Not Surveyed)
- Proposed Boardwalk

Data Sources: LGL Limited field survey & Ontario Ministry of Natural Resources and Forestry (LIO).

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TREE RESOURCES PROTECTION AND REMOVALS



Project: TA8917	Figure: 3c
Date: March, 2020	Prepared By: JJP
Scale: 1 : 150	Checked By: LMC

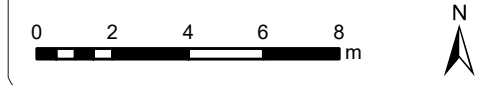


LEGEND

- 326 Dead Tree
- 425 Tree To Be Protected
- 316 Tree To Be Impacted
- 458 Tree To Be Removed
- Dripline
- Tree Protection Fence
- Tree Tags 330-383 (Not Surveyed)
- Proposed Boardwalk

Data Sources: LGL Limited field survey & Ontario Ministry of Natural Resources and Forestry (LIO).

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**TREE RESOURCES
PROTECTION AND REMOVALS**



Project: TA8917	Figure: 3d
Date: March, 2020	Prepared By: JJP
Scale: 1 : 200	Checked By: LMC

2.4.1 Wildlife Habitat

Wildlife and wildlife habitat were found to be distributed across the entire study area. Natural heritage features consisted primarily of manicured grass, cultural meadow, mixed forest, swamp and aquatic habitat types. Wooded communities associated with Leonard's Creek/Leonard's Beach Swamp provincially significant wetland (PSW) and aquatic and riparian habitat associated with two stormwater management ponds were noted to provide the highest quality wildlife habitat within the study area. Anuran breeding habitat was identified within the two stormwater management ponds and migratory bird nesting habitat was identified across much of the study area (see **Section 2.4.2**). Despite the study area containing natural heritage features, existing human disturbance (e.g. litter, trails, etc.) was evident across the lands examined. The wildlife assemblage present within the study area may be influenced by the presence of larger natural heritage features found to the west.

In terms of wildlife, the study area supports an assemblage of common species that are typical of a disturbed landscape. Woodland and aquatic species were also identified within the higher quality communities associated with Leonard's Creek/Leonard's Beach Swamp and aquatic and riparian habitat associated with two stormwater management ponds. The breeding bird community was primarily comprised of open-country, forest/forest edge, aquatic and habitat generalist bird species. Significant wildlife habitat (amphibian breeding, reptile hibernacula, etc.) was not identified within the proposed trail footprint; however, amphibian breeding habitat and other potentially specialized habitats were identified within the vicinity of the trail location (see **Section 2.4.2**). No significant wildlife movement or passage corridors were identified within the lands examined; however, the natural habitats associated with Leonard Creek are expected to provide locally important wildlife movement habitat. The wildlife assemblage identified is generally represented by species tolerant of anthropogenic features and disturbances.

2.4.2 Fauna

Based on field observations, 28 species of wildlife could be verified in the study area and most of these recordings came from identification (through calls and sightings) of bird species with more modest numbers of herpetofauna and mammal species identified. A summary of wildlife species documented in the study area during field investigations is presented in **Table 4**.

**TABLE 4.
WILDLIFE SPECIES DOCUMENTED IN THE STUDY AREA BY LGL (2019)**

Wildlife	Scientific Name	Common Name	SARA	ESA	Legal Status	Other
Herpetofauna	<i>Bufo americanus</i>	American Toad			-	
	<i>Hyla versicolor</i>	Gray Treefrog			FWCA (P)	
	<i>Pseudacris crucifer</i>	Spring Peeper			-	
	<i>Lithobates clamitans</i>	Green Frog			-	
	<i>Thamnophis sirtalis</i>	Eastern Gartersnake			-	
Birds	<i>Charadrius vociferus</i>	Killdeer			MBCA	
	<i>Zenaida macroura</i>	Mourning Dove			MBCA	
	<i>Colaptes auratus</i>	Northern Flicker			MBCA	
	<i>Myiarchus crinitus</i>	Great-crested Flycatcher			MBCA	
	<i>Vireo olivaceus</i>	Red-eyed Vireo			MBCA	INT
	<i>Cyanocitta cristata</i>	Blue Jay			FWCA (P)	
	<i>Corvus brachyrhynchos</i>	American Crow			MBCA	
	<i>Poecile atricapillus</i>	Black-capped Chickadee			MBCA	
	<i>Troglodytes aedon</i>	House Wren			MBCA	
	<i>Turdus migratorius</i>	American Robin			MBCA	
	<i>Sturnus vulgaris</i>	European Starling			-	
	<i>Bombycilla garrulus</i>	Cedar Waxwing			MBCA	
	<i>Dendroica petechia</i>	Yellow Warbler			MBCA	
	<i>Geothlypis trichas</i>	Common Yellowthroat			MBCA	
	<i>Melospica melodia</i>	Song Sparrow			MBCA	
	<i>Cardinalis cardinalis</i>	Northern Cardinal			MBCA	
	<i>Agelaius phoeniceus</i>	Red-winged Blackbird			-	
	<i>Quiscalus quiscula</i>	Common Grackle			-	
	<i>Carduelis tristis</i>	American Goldfinch			MBCA	
	<i>Passer domesticus</i>	House Sparrow			-	
Mammals	<i>Tamias striatus</i>	Eastern Chipmunk			FWCA(P)	
	<i>Sciurus carolinensis</i>	Eastern Gray Squirrel			FWCA(G)	
	<i>Tamiasciurus hudsonicus</i>	Red Squirrel			FWCA(F)	

SARA – federal *Species at Risk Act*:

END - Endangered
THR – Threatened
SC - Special Concern

ESA - *Ontario Endangered Species Act, 2007*

END – Endangered
THR – Threatened
SC - Special Concern

Other:

Significant Wildlife Habitat Technical Guide:
SWH – Area Sensitive Species
INT - Interior Species

For definitions of species ranks, refer to **Appendix C**.

Legal Status:

MBCA - *Migratory Birds Convention Act*
ESA - *Endangered Species Act*
SARA - *Species at Risk Act*
FWCA - *Fish and Wildlife Conservation Act*
(P) Protected Species (G) Game species (F) Furbearing mammals

2.4.2.1 *Herpetofauna*

Methodologies outlined in the Marsh Monitoring Program Protocol (2000) were applied to confirm presence/absence of anuran species, document potential breeding habitat/areas, and confirm the nature, extent and significance of amphibian usage. A single station was strategically placed where amphibian breeding habitat was suspected, based on air-photo interpretation (see **Figure 2**). Field investigations within the study area were conducted on three separate nights during the spring and summer of 2019, ran from one half hour after sunset and ended prior to midnight and were conducted during appropriate weather conditions (see **Table 3**). Investigations were undertaken during periods of peak anuran breeding activity and vocalization.

Anuran breeding evidence was documented for four species during 2019 surveys. Vocalizing male American Toad (*Anaxyrus americanus*), Gray Treefrog (*Hyla versicolor*), Spring Peeper (*Pseudacris crucifer*), and Green Frog (*Rana clamitans*) were noted within the study area or in the immediate vicinity. All evidence of amphibian vocalization was sourced from two stormwater management ponds found southwest of the proposed trail location. Several Gray Treefrogs were noted to be calling from the south edge of the forested habitat, immediately north of the stormwater management pond locations. A summary of anuran species and their respective call level codes is presented in **Table 5**.

A total of five herpetofauna species (one reptile and four amphibians) were observed in the study area during field investigations. The majority of these species were identified during anuran call surveys conducted over three separate surveys. A single Eastern Gartersnake was also noted on June 7, 2019, in the vicinity of the stormwater management ponds.

2.4.2.2 *Birds*

Breeding bird surveys were conducted on two mornings during the 2019 breeding bird season to document breeding bird evidence (BBE) and to characterize the nature, extent and significance of breeding bird usage of the habitats found within the study area (see **Table 3**). Breeding bird survey methodology and breeding bird behaviours used as evidence of breeding success were categorized according to the Breeding Bird Atlas five-year surveys organized by Bird Studies Canada (Cadman et al., 2007). Given the small size of the study area, only a single breeding bird survey station was established. Wandering transects were also used to record incidental bird species. The location of the breeding bird point count station is shown in **Figure 2**.

TABLE 5.
AMPHIBIAN SURVEY OF STUDY AREA AND ADJACENT LANDS BY LGL

Station	Scientific Name	Common Name	SARA	ESA	Local	Legal Status	Call Level Code
1	<i>Bufo americanus</i>	American Toad				-	2
	<i>Pseudacris crucifer</i>	Spring Peeper				-	2
	<i>Hyla versicolor</i>	Gray Treefrog				FWCA(P)	1
	<i>Rana clamitans</i>	Green Frog				-	1

* - No anuran species/individuals documented

Call Level Codes – Abundance Count (according to Bird Studies Canada):

Call Level One (1) – Individual males can be counted accurately.

Call Level Two (2) - Frogs can be generally counted but calls overlap thus no exact number can be obtained.

Call Level Three (3) - Calls continuous and overlapping, no reasonable estimate of numbers.

The study area contained a moderate number of breeding bird species representing several habitat types. Breeding evidence was obtained for 20 species of birds.

Breeding evidence was confirmed in three species, probable in 10 species and possible in an additional seven species. Confirmed breeding by bird species was documented based on adults carrying food for young, including species such as American Robin (*Turdus migratorius*), Yellow Warbler (*Setophaga petechia*) and European Starling (*Sturnus vulgaris*). Probable breeding status was determined based on BBE evidence such as a territory being established, or agitated behaviour being exhibited. A total of 10 species were categorized as probable breeders, several examples include: Red-winged Blackbird (*Agelaius phoeniceus*), Song Sparrow (*Melospica melodia*), Common Yellowthroat (*Geothlypis trichas*) and House Sparrow (*Passer domesticus*).

Species which were most commonly encountered across the study area were generally species associated with open-country, aquatic, forest/forest edge or highly disturbed habitat types. No Species at risk birds were identified during surveys. There was a single species, the Red-eyed Vireo (*Vireo olivaceus*), that is considered an interior species according to the Significant Wildlife Habitat Technical Guide (MNRF 2000), as indicated in **Table 4**. A single individual of this species was noted vocalizing along the forest edge, approximately 50 m west of the proposed trail location. No nests of migratory bird species were identified during field investigations. However, BBE collected during surveys suggests migratory species are expected to nest within the study area.

A summary of the breeding birds documented in the study area during field investigations is presented in **Appendix E**.

2.4.2.3 *Mammals*

Three mammal species were identified during field investigations in the study area, including: Eastern chipmunk (*Tamias striatus*), red squirrel (*Tamiasciurus hudsonicus*) and eastern gray squirrel (*Sciurus carolinensis*). Each of these species was identified in association with wooded habitats found in the study area. The mammal species documented represent an assemblage that readily utilizes human influenced landscapes.

2.4.3 Species at Risk/Species of Concern

Sixteen recorded species of birds are protected under the *Migratory Birds Convention Act* (MBCA) and one bird species is protected under the *Fish and Wildlife Conservation Act* (FWCA). Four bird species are not afforded any legislative protection. Three recorded mammal species are afforded protection under the FWCA. As noted above, a single species identified, the Red-eyed Vireo, is considered an interior species according to the Significant Wildlife Habitat Technical Guide (MNR 2000) (see **Table 4**).

Of the twenty-eight (28) wildlife species recorded within the study area by LGL (2019), none are regulated under the Ontario *Endangered Species Act, 2007* (ESA) or the federal *Species at Risk Act* (SARA). A query for rare species was conducted on the Natural Heritage Information Centre (NHIC) Biodiversity Explorer database (MNR 2019) and no rare species records were found in association with the study area. A natural heritage data request was submitted to Lake Simcoe Region Conservation Authority (submitted October 1, 2019); however, no fauna records were provided in their response (received October 8, 2019). An information request was sent to the MNR, Midhurst District on October 10, 2019 requesting information on species at risk previously identified within proximity to the study area. No response has been provided to date.

Based on the forested habitat which dominate portions of the subject property, there is potential for endangered bat species (all regulated species under the ESA), including eastern small-footed myotis (*Myotis leibii*), little brown myotis (*Myotis lucifugus*), northern myotis (*Myotis septentrionalis*), and tri-coloured bat (*Perimyotis subflavus*).

The species described above, their respective legal status, biological requirements and the likelihood of presence within the study area are discussed below.

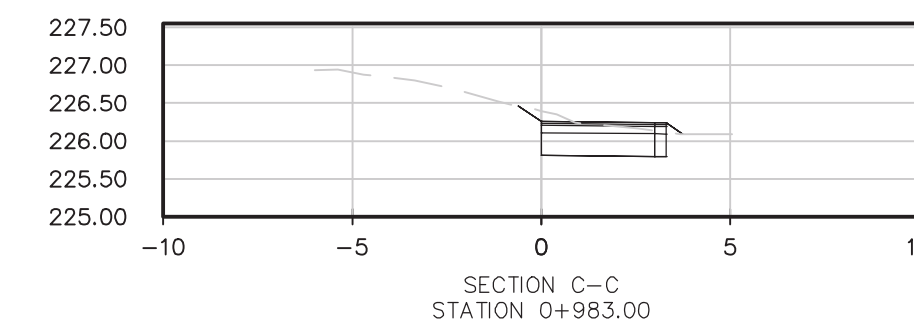
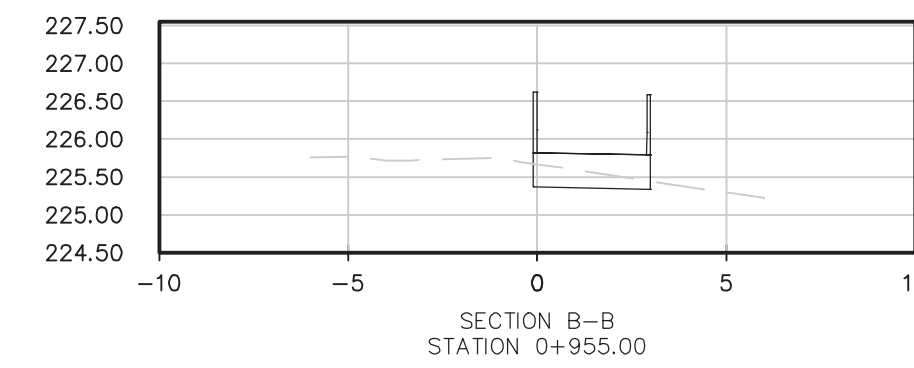
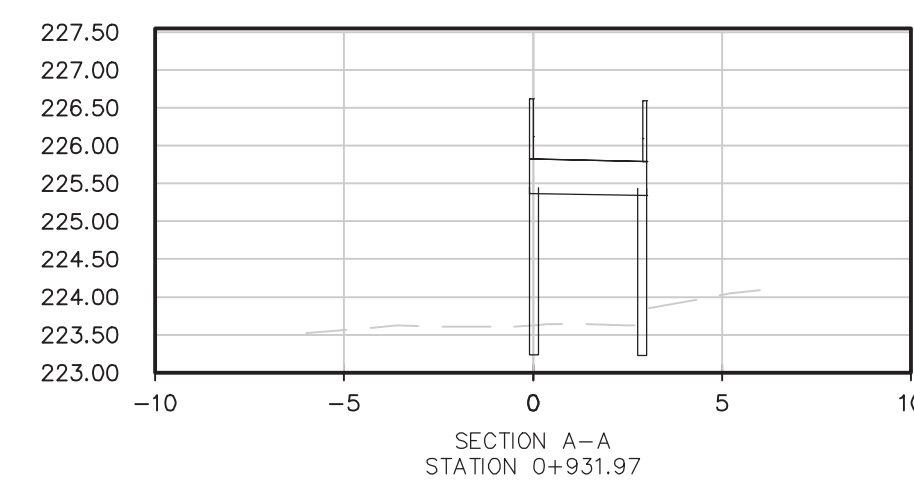
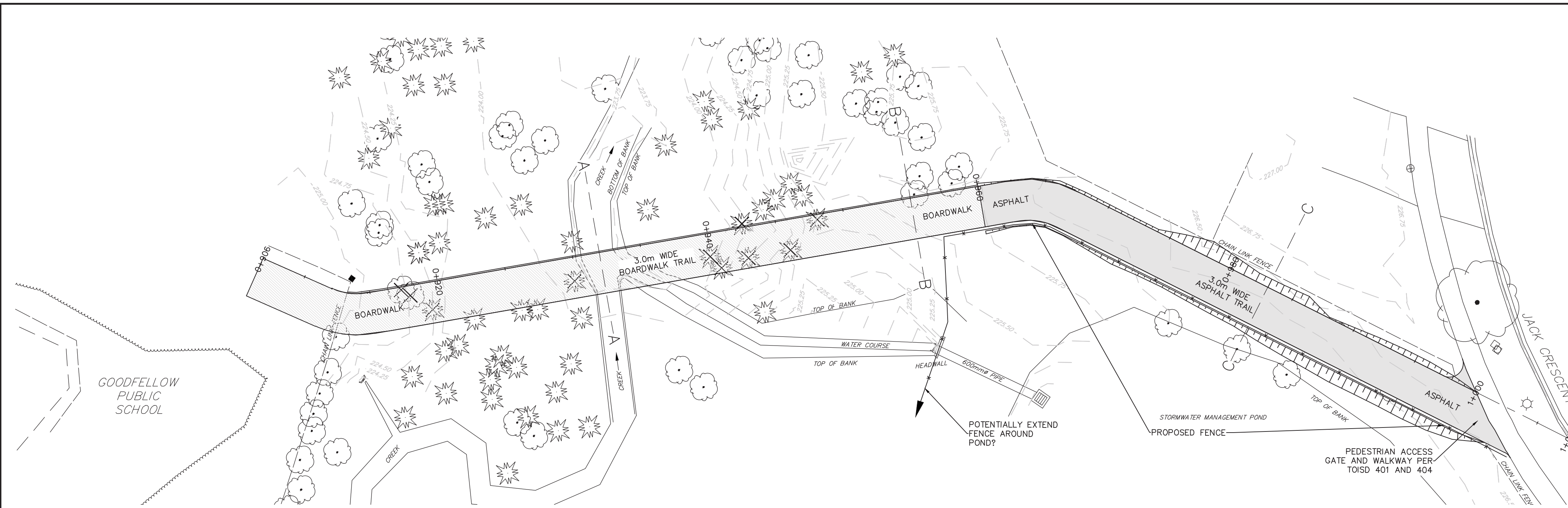
2.4.3.1 *Bats*

As noted above, treed portions of the site may provide suitable roosting habitat for a variety of bats species. There are currently four bat species regulated as 'Endangered' under the Ontario ESA, including: eastern small-footed myotis; little brown myotis; northern myotis; and, tri-colored bat. The ESA affords protection for both individuals of these species (subsection 9(1)) and their habitat (subsection 10(1)). Given that species-specific habitat regulations have not yet been developed for SAR bats, habitat is protected according to the general definition provided in the ESA. Specifically, according to section 2(1), the Act protects "an area, on which the species depends, directly or indirectly, to carry on its life processes, including processes such as reproduction, rearing, hibernation, migration or feeding".

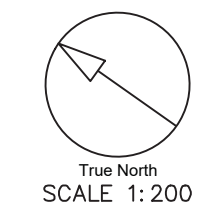
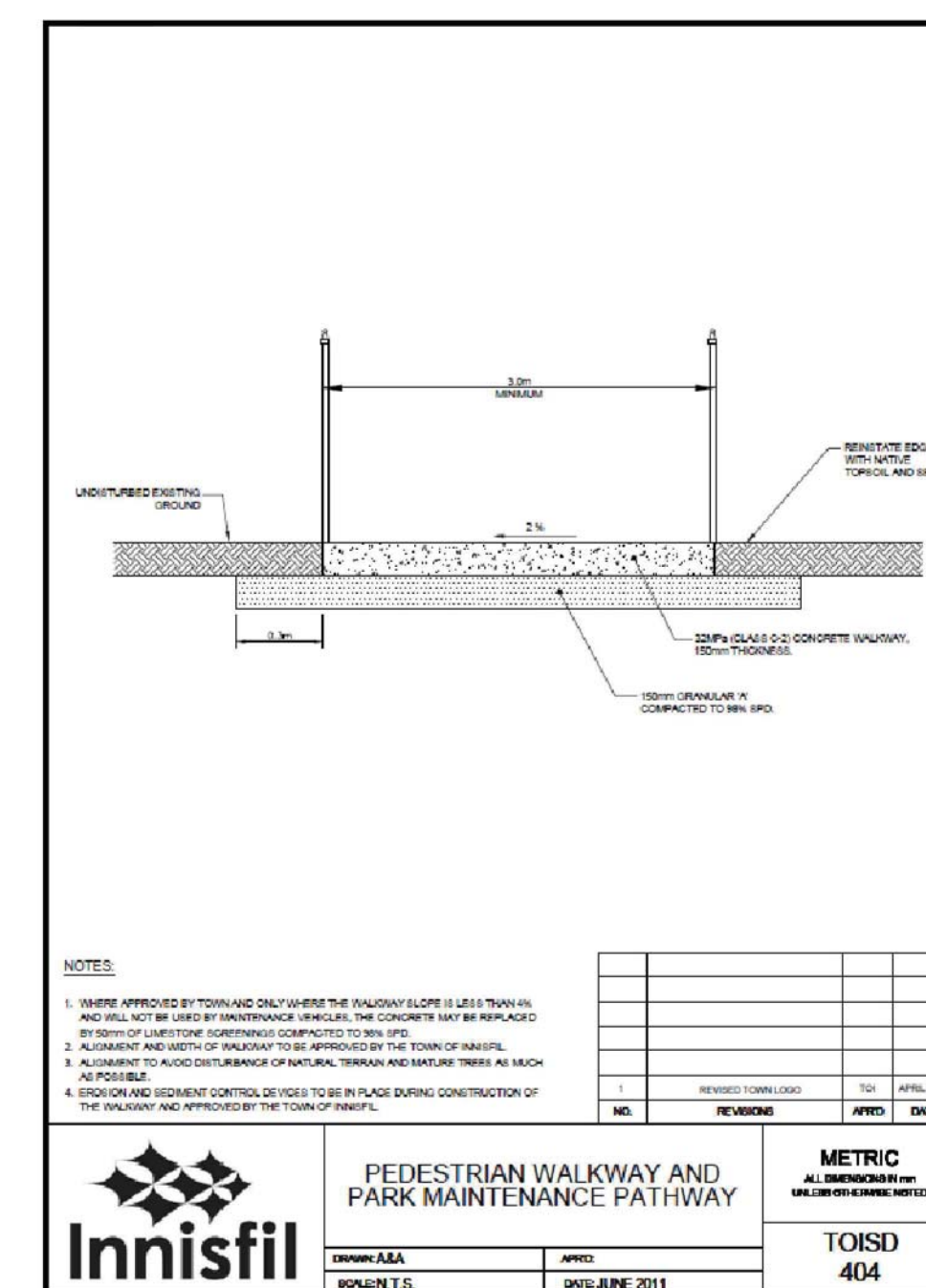
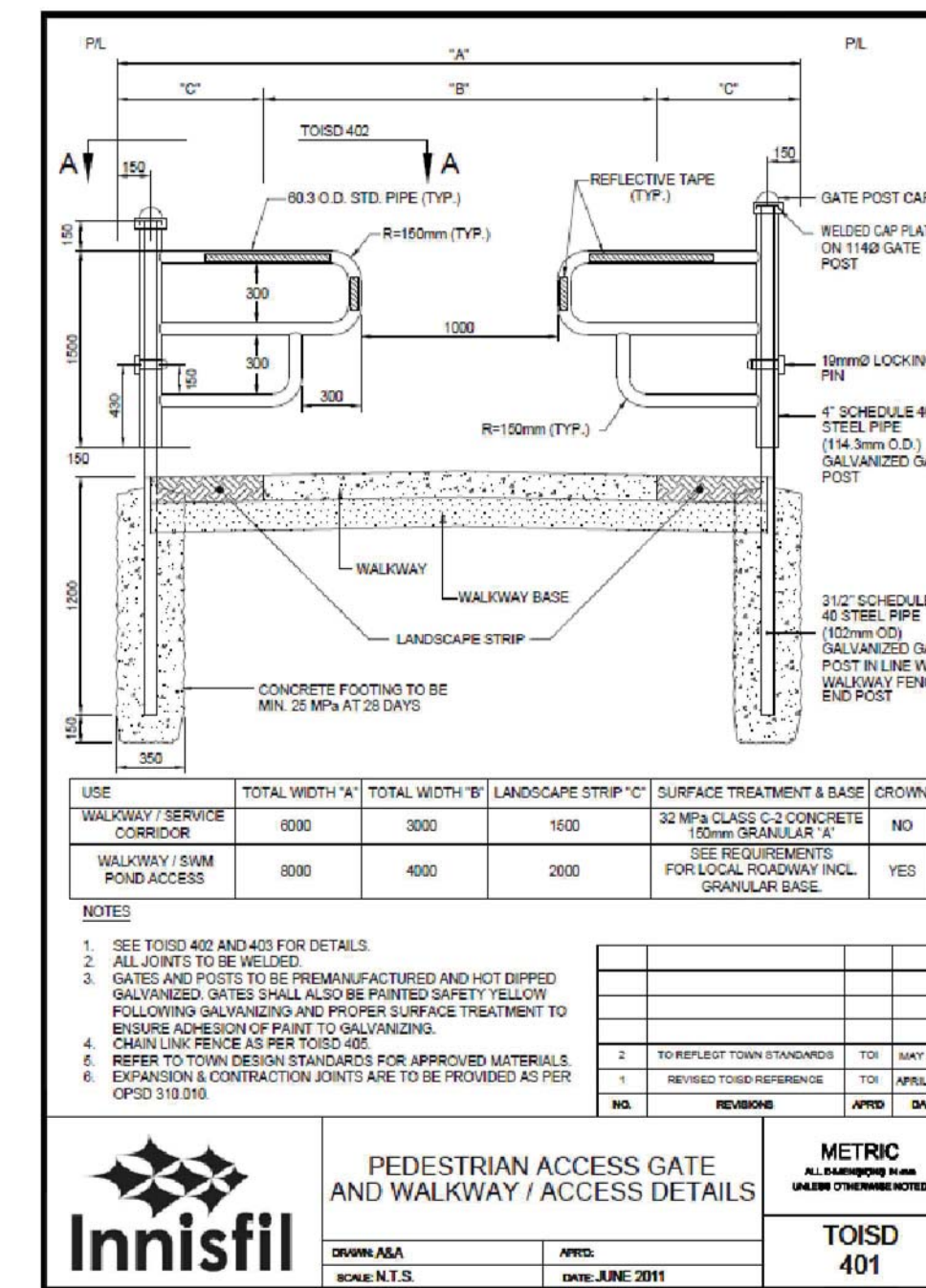
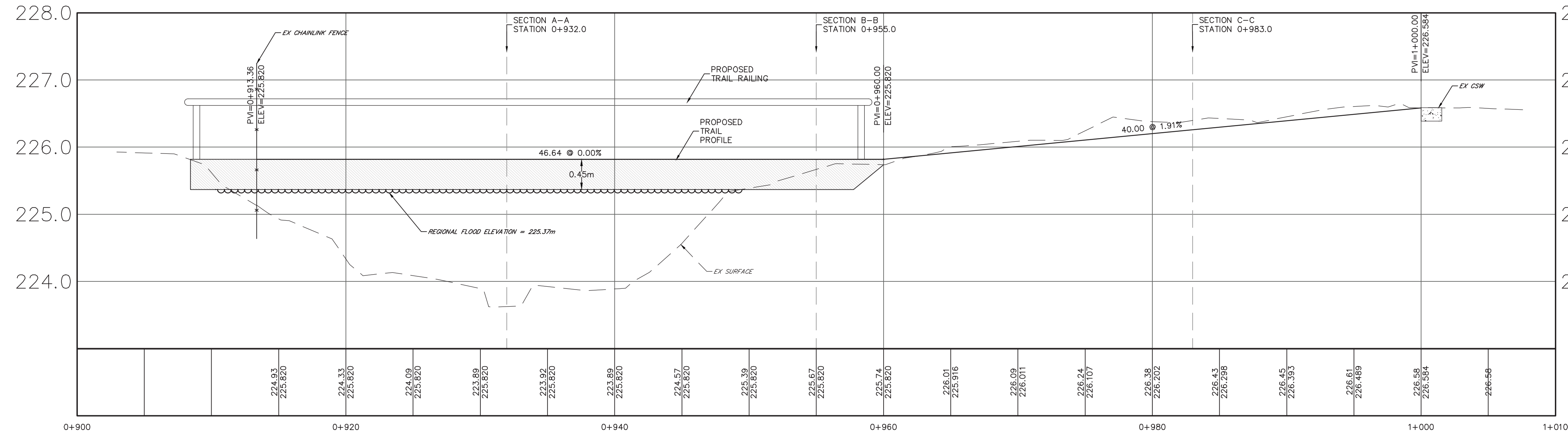
Mature trees which could contain suitable roosting habitat for SAR bats were identified in association with treed portions of Leonard's Creek/Leonard's Beach Swamp PSW. The stormwater management ponds found southwest of the proposed trail location have the potential to offer suitable foraging habitat for bat species. Little brown myotis and northern myotis will use cavities in the trees or exfoliating bark, while tri-coloured bat roosts in clumps of leaves in the foliage. Within the study area, many treed habitats occur, and all of these were considered potentially suitable. Little brown myotis will frequently use buildings and the other three endangered bat species will use buildings, but far less frequently. Eastern small-footed myotis is a saxicolous (rock-loving) species and will frequently roost in rock piles, talus or crack and crevices in rock outcrops. A more detailed evaluation of bat habitat and the occupancy of their habitat would be required to appropriately demonstrate presence or absence of these species.

3.0 PROJECT DESCRIPTION

The recreational trail is 96.0 m long and 3.0 m wide with a 0.5 m lateral clearance on each side. The central 45.0 m segment of the trail will consist of an elevated boardwalk, while the north and south segments of the trail will consist of asphalt pavement. The boardwalk segment will be elevated approximately 1.5 m above existing ground level to meet the regional flood elevation and include a railing. The paved segments will be at ground level at Goodfellow Public School or elevated slightly on gravel fill to tie into the sidewalk located on the north side of Jack Crescent. Drainage from the boardwalk segment will flow between the boards, while drainage from the asphalt segment will sheet flow onto adjacent lands. The general arrangement (GA) drawing for the proposed trail is shown in **Figure 4**.



PROPOSED TRAIL - Vert Ex.-5x



CLIENT

INNISFIL ONTARIO

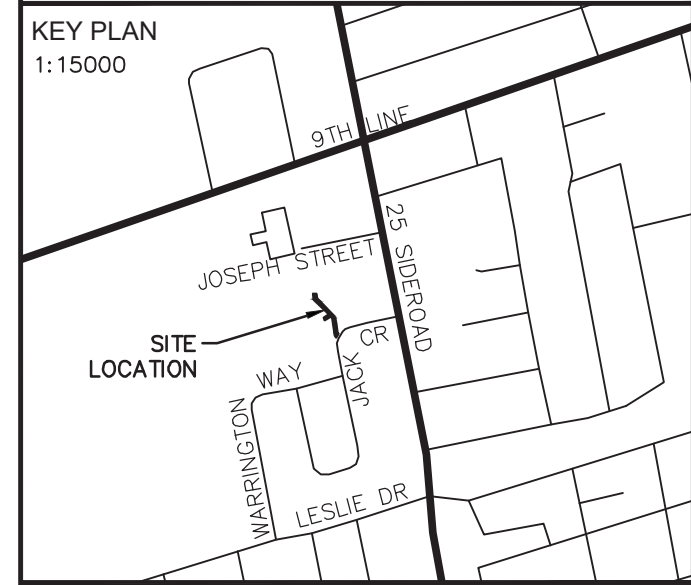
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ISSUES

No.	DESCRIPTION	DATE
####	####	####

NOT FOR CONSTRUCTION



CONSULTANTS

SEAL

IBI GROUP
Suite 101 - 410 Albert Street
Waterloo ON N2L 3V3 Canada
Tel: 519 585 2255
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PROJECT
JACK CRESSENT PROPOSED TRAIL

PROJECT NO:
117239

DRAWN BY:
RPM

CHECKED BY:
RPM/JRP

PROJECT MGR:
####

APPROVED BY:
JRP

SHEET TITLE
PRELIMINARY TRAIL PLAN AND PROFILE

SHEET NUMBER
1

ISSUE
NA

4.0 IMPACT ASSESSMENT AND MITIGATION

4.1 FISHERIES

The recreational trail has the potential to result in impacts to aquatic habitats and communities. Effects on these features related to these modifications could include:

- temporary disruption or permanent loss of site-specific habitat;
- temporary changes to water quality;
- changes in water temperature; and,
- barriers to fish passage.

The recreational trail will cross Leonard's Creek and the adjacent riparian area. The proposed work will not have any direct impacts to the watercourse as the crossing will consist of an elevated boardwalk constructed above the regional flood elevation, which will span the watercourse.

Further details regarding works, net environmental effects and site-specific mitigation proposed at the crossings can be found in the sections below.

4.1.1 Temporary Disruption or Permanent Loss of Site-Specific Habitat

The proposed works at the location mentioned above have the potential to result in the indirect impacts to localized fish habitat. Although the construction of the boardwalk will require no instream works, there is potential for serious harm. The proposed boardwalk will cover as little watercourse area as possible, with all work performed along the banks reinforced with erosion and sediment control measures to isolate work areas and prevent inputs of deleterious substances.

To reduce the potential for serious harm to fish habitat, the following environmental protection measures will be implemented:

- an in-water work/work within riparian habitat construction timing restriction will be implemented to protect spawning fish, incubating eggs and fry emergence: as the watercourse has a coldwater thermal regime, spawning occurs earlier in the year, thus, a coldwater timing window for in-water work/work within riparian habitat allows work to occur from July 1 to September 15 (to be confirmed by MNRF and LSRCA);

- work areas will be delineated with construction fencing to minimize the area of disturbance;
- appropriate erosion and sediment control structures will be installed prior to and maintained during construction to prevent entry of sediments into the watercourse, in particular, through use of filtersoxx (or similar), which will also maintain bank stability;
- good housekeeping practices related to materials storage/stockpiling, equipment fuelling/ maintenance, etc. will be implemented during construction; and,
- disturbed riparian areas will be vegetated and/or covered with an erosion control blanket as quickly as possible to stabilize the banks and minimize the potential for erosion and sedimentation.

These environmental protection measures will greatly reduce the potential adverse effects to fish and fish habitat resulting from construction activities.

4.1.2 Temporary Change to Water Quality

The construction associated with the proposed works has the potential to alter water quality through on-site erosion of exposed materials and the subsequent impairment of downstream water quality with sediments and other contaminants.

Changes to water quality will be mitigated through the majority of work areas to be isolated outside of the watercourse and the deployment and maintenance of erosion and sediment control measures (filtersoxx, silt fencing, etc.) which will prevent sediments from reaching the watercourse from exposed soils upslope. OPSS 805, Construction Specification for Temporary Erosion and Sediment Control Measures, will be followed. All exposed areas should be vegetated as quickly as possible once the work is completed.

The implementation of these mitigation measures should eliminate potential changes to water quality to the receiving watercourse.

4.1.3 Changes in Water Temperature

The thermal regime of a receiving watercourse may be altered by storm water runoff or removal of riparian vegetation that shades the watercourse. In the summer, runoff can become superheated through contact with paved surfaces, which, when discharged to a receiving watercourse can result in thermal shock, thereby injuring or killing aquatic

organisms. Coldwater or coolwater streams are usually considered more sensitive to changes in water temperature than warmwater streams.

It is expected that there will be no significant increase in temperature as a result of the proposed works as long as appropriate erosion and sediment control measures and storm water management strategies are implemented (see **Section 4.1.2**). Stormwater runoff will be minimal, since a boardwalk is proposed with the regional flood elevation.

4.1.4 Barriers to Fish Passage

No barriers to fish passage will result from this project.

4.1.5 Risk of Serious Harm

DFO has introduced a self-assessment process for proponents to determine if *Serious Harm* to fish or fish habitat is expected as a result of activities from the project.

Proponents use DFO screening criteria to determine if a review of the project by DFO is required under the *Fisheries Act*.

The boardwalk segment of the trail will be above the regional storm elevation and no in-water work is required; therefore, the risk of the project to result in serious harm is low and there is no requirement for DFO to review the project or to authorize the project under the *Fisheries Act*.

4.2 VEGETATION

Construction of the recreational trail has the potential to result in impacts to vegetation and vegetation communities. Effects on vegetation related to the construction of the trail could include:

- Displacement of and/or disturbance to vegetation and vegetation communities; and,
- Displacement of and/or disturbance to rare, threatened or endangered vegetation and vegetation communities.

4.2.1 Displacement of and/or Disturbance to Vegetation and Vegetation Communities
Removal of vegetation and vegetation communities as a result of the proposed trail is considered to be minor. A total of 0.25 ha of vegetation communities will be impacted with the largest impact occurring to the cultural meadow community. Impacts to the

cultural meadow community as a result of the proposed trail is considered to be minor in nature. As noted in **Section 2.3.1**, cultural vegetation communities typically persist in areas that are regularly disturbed, and as a result, contain a high proportion of invasive and non-native plant species that are tolerant of these conditions. Disturbance activities often serve to promote the establishment and/or spread of certain plant species such as those disturbance tolerant species. As such, it is anticipated that no significant disturbance to the cultural meadow community will occur.

Impacts to the coniferous swamp and mixed forest communities will result in the removal of a small number of trees and shrubs. Impacts to trees within the study area are further discussed in **Section 4.2.3**. The placement of the boardwalk through these communities has the potential to result in the creation of new *ad hoc* paths should pedestrians not remain on the designated boardwalk. In addition to railings being placed on the boardwalk, it is recommended that native shrub and herbaceous plantings be undertaken along the edge of the trail to act as a barrier and prevent further intrusion into the forest and wetland communities.

4.2.2 Displacement of and/or Disturbance to Rare, Threatened or Endangered Vegetation and Vegetation Communities

All of the vegetation communities identified within the study area are considered to be widespread and common in Ontario and secure globally. As noted in **Section 2.3.2**, no plant species that are regulated under the Ontario *Endangered Species Act* were identified within the study area. However, purple flowering raspberry is considered rare in Simcoe County and was identified within the mixed forest community. Efforts should be made prior to the start of construction to locate any purple flowering raspberry individuals that will be impacted by the proposed trail construction. Where possible, these plants should be transplanted outside of the limit of disturbance and into similar light and moisture conditions.

The construction of the trail will result in minor vegetation removals within the Leonard's Beach Swamp PSW. As noted above, plantings of native shrubs and herbaceous plants along the edge of the new trail is recommended to minimize impacts to the PSW.

4.2.2.1 *Plant Salvage*

A plant salvage should be undertaken to relocate those species that will be disturbed as a result of the boardwalk construction. Herbaceous plants, Shrubs and trees that measure less than 10 cm DBH, should be transplanted into suitable conditions outside

of the limit of disturbance. Where possible, these species should be planted along the edge of the new boardwalk.

4.2.2.2 *Invasive Species Management*

Efforts should be made to prevent the spread of invasive plant species during construction both on and off site. Sanitation of construction equipment should be undertaken in accordance with the Clean Equipment Protocol (2013) and at a minimum should include sanitation of construction vehicles and equipment prior to entering and leaving the site.

4.2.3 Tree Impact Assessment

An impact assessment was completed to determine impacts to tree resources as a result of the proposed construction of the recreational trail. This assessment was conducted using the proposed trail design provided to LGL by IBI in October 2019. The impact assessment was completed by comparing the extent of tree dripline and tree location with the proposed disturbance limits. Trees recommended for removal include trees within the proposed location of the trail. In addition, trees identified as retained are considered to be minimally affected and will be protected through mitigation measures. Note that this impact assessment is an estimate based on the information available at the time of report preparation and some assumptions have been made since the exact machine type and dimension, limits of disturbance, and roots zones are not known.

A total of 23 and 2 trees will be removed and impacted, respectively. No impacts are anticipated to the remaining 190 trees within the study area. However, it should be noted that of the 190 trees, 7 trees are dead and consideration should be given to removal of these tree if they are within close proximity of the proposed trail. The results of the impact assessment are summarized in **Appendix D** per tree and presented in **Figures 3A to 3D**.

4.2.3.1 *Tree Protection/Mitigation Recommendations*

Designation of a Tree Protection Zone (TPZ) is imperative for the protection of trees (roots, trunks, branches) adjacent to construction works. The TPZ will restrict construction related machinery and activities from damaging trees identified for protection. Recommended minimum tree protection zones are summarized in **Appendix D**.

The following general mitigation recommendations are provided to minimized impacts to

trees in the study area. These recommendations conform to good forestry practices and are designed to help ensure impacts to trees surrounding the work zone, and those identified to be retained are minimized. Protection recommendations include:

- Tree protection fencing should be installed in the locations presented in **Figures 3A to 3D** and in accordance with the Town of Innisfil tree protection specifications and OPSS 801, Construction Specification for the Protection of Trees;
- Tree protection hoarding/barrier must be installed prior to the commencement of any construction activities;
- Heavy machinery should not to be operated within the TPZ (including overhead swinging of machine arms);
- Construction materials, equipment, soil, construction waste or debris are not to be stored within the TPZ or dripline of the trees identified for protection;
- There should be no movement or parking of vehicles, placement of equipment or pedestrian traffic within the TPZ;
- No signs or objects should be displayed or affixed to any trees protected by the City;
- Disposal of any liquids shall not occur within the TPZ;
- Soil compaction mitigation should be implemented where the minimum TPZ cannot be maintained and includes an application of wood chips/mulch to a depth of 100mm and overlaying steel sheeting to dissipate the weight of machinery driven overtop.
- All tree and shrub protection must be removed upon completion of construction activities;
- Tree clearing shall not be conducted during the Migratory Bird Convention Act (MBCA) breeding season and bat maternity roost season commonly considered April 1 to October 31, unless under appropriate permitting;
- All trees shall be felled into the trail footprint area, and not into adjacent areas; and,
- All trees to be removed shall be close-cut to the ground and not grubbed out in accordance with OPSS 201, Construction Specification for Clearing, Close Cut Clearing, Grubbing and Removal of Surface and Piled Boulders.

4.3 WILDLIFE

The proposed trail will result in minimal impact to wildlife and wildlife habitat. Impacts such as temporary disturbance or displacement of habitat resulting from construction will not have any significant effects on wildlife. Impacts to aquatic features found near the study area should be avoided as these communities may function as specialized wildlife habitat. The minor impacts associated with the proposed trail and opportunistic nature of those species that have the potential to be affected will allow them to move to nearby vegetation communities and re-establish. Disturbance to wildlife from the presence of a newly constructed trail (noise, odors, etc.) may cause some local wildlife species to re-locate or move to nearby habitats. However, based on the presence of existing informal trails, litter, and other anthropogenic influences, it appears as though the area already experiences a level of disturbance from the neighbouring school and residences. It is recommended that educational signage be erected to advise users that entry into the natural areas surrounding the boardwalk be prohibited. The boardwalk railings should serve to deter individuals from leaving the trail. Clearly visible waste disposal containers should also be included to reduce littering in the area. Since the trail will not be lit at night, no light impacts on nocturnal animals such as frogs and birds, are anticipated.

No species at risk were identified during the survey conducted by LGL in 2019. However, as noted above, the potential exists for several bat species at risk to occupy trees within the vicinity of the study area. As a precaution to protect bats, a timing window for tree removal is recommended. It is recommended that no tree removal occur between April 1 and October 31, of a given year. No permitting under the ESA or SARA is anticipated given the low likelihood of species at risk presence within the study area. However, the results of this investigation should be communicated to MECP, to determine if any permitting requirement exists.

The MBCA prohibits the killing, capturing, injuring, taking or disturbing of migratory birds (including eggs) or damaging, destroying, removing or disturbing of nests. Migratory insectivorous and non-game birds are protected year-round, and migratory game birds are protected from March 10 to September 1. Environment Canada provides Nesting Periods when migratory birds are most likely to be nesting, within a respective geographic zone. The subject property falls within Environment Canada's Nesting Zone C2 (Nesting Period: end of March – end of August). This timing restriction will avoid the destruction or disturbance of bird species using the available habitat in the study area.

Should this not be possible, a nesting bird survey will be undertaken immediately prior to any vegetation clearing. If active nests are found, vegetation removal will not be permitted until the nestlings have fledged and left the nest.

The recreational trail will not pose an obstacle to wildlife moving through the area. The most sensitive area, which includes the Leonard Beach Swamp PSW and Leonard Creek, will be spanned using an elevated boardwalk. The wildlife movement corridor along Leonard Creek will be maintained by the narrow trail width, limited tree clearing and the elevated boardwalk.

Prior to vegetation clearing, a wildlife salvage will be carried out to prevent injury or death to wildlife located within work zones. A Scientific Collectors Permit will be obtained under the *Fish and Wildlife Conservation Act*.

4.4 OTHER CONSIDERATIONS

Most of the recreational trail lies within an area regulated under Ontario Regulation 179/06 under Section 28 of the *Conservation Authorities Act*. A permit will be obtained from LSRCA prior to construction of the recreational trail.

5.0 RECOMMENDATIONS AND CONCLUSIONS

The recreational trail can be constructed and maintained with no significant adverse effects on natural heritage features/areas or their ecological functions. The following recommendations for the recreational trail will be implemented by the Town of Innisfil:

- Vegetation clearing will be limited to 4.0 m to accommodate a 3.0 m wide trail, with 0.5 m clearance on both sides;
- Tree protection barrier will be erected in accordance with OPSS 801, trees will be close cut in accordance with OPSS 201 and trees will be felled into the work zone;
- Erosion and sediment controls will be installed in accordance with OPSS 805;
- A closed tree canopy will be maintained to maintain micro-climate conditions and to prevent the establishment of invasive/exotic plant species;
- A boardwalk tread surface will be installed above the regional flood elevation to maintain existing hydraulic/hydrologic conditions, wildlife passage and avoid in-water and near-water work;
- A railing will be installed on the boardwalk to prevent trampling of vegetation, soil compaction, harassment of wildlife, etc. on nearby areas of the Leonard Beach Swamp PSW;
- Vegetation will be cleared outside of the migratory bird and bat maternity roost window (April 1 to October 31) to prevent incidental take of migratory birds, bats and disturbance to other wildlife during the sensitive breeding season; and,
- A plant and wildlife salvage will be performed prior to construction under a Scientific Collectors Permit issued under the *Fish and Wildlife Conservation Act*.

Based on our review of secondary source information, field investigations, and screening of existing habitat conditions for the potential presence of species at risk, it is our opinion that the proposed trail will not kill, harm or harass species at risk, or destroy or damage the habitat of species at risk, in accordance with Sections 9 and 10 of the Ontario *Endangered Species Act*. As a result, a permit or registration of the project under the Ontario *Endangered Species Act* is not anticipated to be required.

6.0 REFERENCES

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APPENDIX A.
FISHERIES PHOTO APPENDIX

PHOTO APPENDIX



Photo 1: Upstream of proposed crossing, at the confluence of the storm water management channel with Leonard's Creek, approximately 5 m from proposed crossing



Photo 2: Facing southeast (downstream) from upstream end of proposed crossing



Photo 3: Facing northeast (downstream) at downstream end of proposed crossing



Photo 4: Facing northeast (downstream) at downstream end of proposed crossing

APPENDIX B.

LIST OF VASCULAR PLANTS RECORDED DURING FLORA SURVEYS

<i>Fagus grandifolia</i>	American beech	G5	S5			X		X	
POLYGONACEAE	SMARTWEED FAMILY								
* <i>Rumex crispus</i>	curly-leaf dock	G?	SE5			X	X		
TILIACEAE	LINDEN FAMILY								
<i>Tilia americana</i>	basswood	G5	S5			X		X	
SALICACEAE	WILLOW FAMILY								
<i>Populus deltoides ssp. deltoides</i>	eastern cottonwood	G5T?	SU			X Int	X		X
<i>Salix sp.</i>	willow		?				X		
<i>Populus tremuloides</i>	trembling aspen	G5	S5			X		X	X
<i>Populus balsamifera ssp. balsamifera</i>	balsam poplar	G5T?	S5			X			X
BRASSICACEAE	MUSTARD FAMILY								
* <i>Nasturtium officinale</i>	water-cress	G?	SE?						X
* <i>Brassica rapa</i>	wild turnip	G?	SE5			X	X		
GROSSULARIACEAE	GOOSEBERRY FAMILY								
<i>Ribes hirtellum</i>	smooth gooseberry	G5	S5			X		X	
ROSACEAE	ROSE FAMILY								
<i>Rubus odoratus</i>	purple flowering raspberry	G5	S5			R-5		X	
<i>Prunus virginiana ssp. virginiana</i>	choke cherry	G5T?	S5			X		X	
* <i>Potentilla recta</i>	rough-fruited cinquefoil	G?	SE5			X	X		
<i>Amelanchier laevis</i>	smooth juneberry	G4G5Q	S5			X		X	
<i>Prunus sp.</i>	cherry						X		
<i>Fragaria virginiana ssp. virginiana</i>	scarlet strawberry	G5T?	SU			X		X	
FABACEAE	PEA FAMILY								
* <i>Medicago lupulina</i>	black medick	G?	SE5			X	X		
* <i>Lathyrus latifolius</i>	everlasting pea	G?	SE4			X		X	
ONAGRACEAE	EVENING-PRIMROSE FAMILY								
<i>Oenothera biennis</i>	common evening-primrose	G5	S5			X	X		
CORNACEAE	DOGWOOD FAMILY								
<i>Cornus alternifolia</i>	alternate-leaved dogwood	G5	S5			X		X	

<i>Cornus stolonifera</i>	red-osier dogwood	G5	S5			X	X	X	X
RHAMNACEAE	BUCKTHORN FAMILY								
* <i>Rhamnus cathartica</i>	common buckthorn	G?	SE5			X		X	
VITACEAE	GRAPE FAMILY								
<i>Vitis riparia</i>	riverbank grape	G5	S5			X		X	
<i>Parthenocissus inserta</i>	inserted Virginia-creeper	G5	S5			X		X	
ACERACEAE	MAPLE FAMILY								
* <i>Acer platanoides</i>	Norway maple	G?	SE5			X	X		
<i>Acer rubrum</i>	red maple	G5	S5			X			X
<i>Acer negundo</i>	Manitoba maple	G5	S5			X		X	
ANACARDIACEAE	SUMAC FAMILY								
<i>Rhus typhina</i>	staghorn sumac	G5	S5			X	X		X
<i>Rhus radicans ssp. negundo</i>	poison-ivy	G5T	S5			X		X	
BALSAMINACEAE	TOUCH-ME-NOT FAMILY								
<i>Impatiens capensis</i>	spotted touch-me-not	G5	S5			X			X
ARALIACEAE	GINSENG FAMILY								
<i>Aralia nudicaulis</i>	wild sarsaparilla	G5	S5			X		X	
APIACEAE	PARSLEY FAMILY								
* <i>Daucus carota</i>	wild carrot	G?	SE5			X	X		
APOCYNACEAE	DOGBANE FAMILY								
<i>Apocynum androsaemifolium ssp. androsaemifolium</i>	spreading dogbane	G5T?	S5			X		X	
ASCLEPIADACEAE	MILKWEED FAMILY								
* <i>Cynanchum rossicum</i>	swallow-wort	G?	SE5			X	X	X	
<i>Asclepias syriaca</i>	common milkweed	G5	S5			X	X		
SOLANACEAE	POTATO FAMILY								
* <i>Solanum dulcamara</i>	bitter nightshade	G?	SE5			X			X
HYDROPHYLLACEAE	WATER-LEAF FAMILY								
<i>Hydrophyllum virginianum</i>	Virginia water-leaf	G5	S5			X		X	

<i>Arisaema triphyllum ssp. triphyllum</i>	small jack-in-the-pulpit	G5T5	S5			X		X	
JUNCACEAE	RUSH FAMILY								
<i>Juncus tenuis</i>	path rush	G5	S5			X			X
CYPERACEAE	SEDGE FAMILY								
<i>Carex rosea</i>	stellate sedge	G5	S5			X		X	
<i>Carex gracillima</i>	graceful sedge	G5	S5			X			X
<i>Carex lacustris</i>	lake-bank sedge	G5	S5			X			X
POACEAE	GRASS FAMILY								
* <i>Bromus inermis ssp. inermis</i>	awnless brome	G4G5T?	SE5			X	X		
<i>Poa pratensis ssp. pratensis</i>	Kentucky bluegrass	G5T	S5			X	X		
<i>Poa palustris</i>	fowl meadow grass	G5	S5			X			X
<i>Phragmites australis</i>	common reed	G5	S5			X	X		
<i>Phalaris arundinacea</i>	reed canary grass	G5	S5			X			X
* <i>Elymus repens</i>	quack grass	G?	SE5			X	X		
* <i>Dactylis glomerata</i>	orchard grass	G?	SE5			X	X		
TYPHACEAE	CATTAIL FAMILY								
<i>Typha latifolia</i>	broad-leaved cattail	G5	S5			X	X		
LILIACEAE	LILY FAMILY								
<i>Trillium grandiflorum</i>	white trillium	G5	S5			X		X	
<i>Maianthemum canadense</i>	wild lily-of-the-valley	G5	S5			X		X	
* <i>Convallaria majalis</i>	lily-of-the-valley	G5	SE5			X		X	

APPENDIX C

ACRONYMS AND DEFINITIONS USED IN SPECIES LISTS

ACRONYMS AND DEFINITIONS USED IN SPECIES LISTS

G-Rank Global Rank

Global ranks are assigned by a consensus of the network of Conservation Data Centres, scientific experts, and the Nature Conservatory to designate a rarity rank based on the range-wide status of a species, subspecies or variety.

The most important factors considered in assigning global ranks are the total number of known, extant sites world-wide, and the degree to which they are potentially or actively threatened with destruction. Other criteria the number of known populations considered to be securely protected, the size of the various populations, and the ability of the taxon to persist at its known sites. The taxonomic distinctness of each taxon has also been considered. Hybrids, introduced species, and taxonomically dubious species, subspecies and varieties have not been included.

- G1= Extremely rare; usually 5 or fewer occurrences in the overall range or very few remaining individuals; or because of some factor(s) making it especially vulnerable to extinction.
- G2 = Very rare; usually between 5 and 20 occurrences in the overall range or with many individuals in fewer occurrences; or because of some factor(s) making it vulnerable to extinction.
- G3 = Rare to uncommon; usually between 20 and 100 occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.
- G4 = Common; usually more than 100 occurrences; usually not susceptible to immediate threats.
- G5 = Very common; demonstrably secure under present conditions.
- GH = Historic, no records in the past 20 years.
- GU = Status uncertain, often because of low search effort or cryptic nature of the species; more data needed.
- GX = Globally extinct. No recent records despite specific searches.
- ? = Denotes inexact numeric rank (i.e. G4?).

- G" " = A "G" (or "T") followed by a blank space means that the NHIC has not yet obtained the Global Rank from The Nature Conservancy.
- G? = Unranked, or, if following a ranking, rank tentatively assigned (e.g. G3?).
- Q = Denotes that the taxonomic status of the species, subspecies, or variety is questionable.
- T = Denotes that the rank applies to a subspecies or variety.

S-Rank **Provincial Rank**

Provincial (or Sub-national) ranks are used by the Ontario Ministry of Natural Resources Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for the global ranks, but consider only those factors within the political boundaries of Ontario. By comparing the global and provincial ranks, the status, rarity, and the urgency of conservation needs can be ascertained. The NHIC evaluates provincial ranks on a continual basis and produces updated list at least annually.

- S1 = Critically imperiled in Ontario because of extreme rarity (often 5 or fewer occurrences) or because of some factor (s) such as very steep declines making it especially vulnerable to extirpation.
- S2 = Imperiled in Ontario because of rarity due to very restricted range, very few populations (often 20 or fewer occurrences) steep declines or other factors making it very vulnerable to extirpation.
- S3 = Vulnerable in Ontario due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
- S4 = Apparently secure - uncommon but not rare; some cause for long-term concern due to declines or other factors.
- S5 = Secure - common, widespread, and abundant in Ontario.
- SX = Presumed Extirpated - specie or community is believed to be extirpated from Ontario.
- SNR = Unranked - conservation status in Ontario not yet assessed
- SU = Unrankable - currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
- SNA = Not applicable - a conservation status rank is not applicable because the species is not a suitable target for conservation activities.
- S#S# = Range rank - a numeric range rank (e.g. S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g. SU is used rather than S1S4).

COSEWIC Committee On The Status Of Endangered Wildlife in Canada

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assesses the national status of wild species that are considered to be at risk in Canada.

Extinct (X)	A wildlife species that no longer exists.
Extirpated (XT)	A wildlife species no longer existing in the wild in Canada, but occurring elsewhere.
Endangered (E)	A wildlife species facing imminent extirpation or extinction.
Threatened (T)	A wildlife species likely to become endangered if limiting factors are not reversed.
Special Concern (SC)	A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
Not at Risk (NAR)	A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.
Data Deficient (DD)	A category that applies when the available information is insufficient (a) to resolve a wildlife species' eligibility for assessment or (b) to permit an assessment of the wildlife species' risk of extinction.

COSSARO/OMNR Committee On The Status Of Species At Risk In Ontario/Ontario Ministry Of Natural Resources

The Committee on the Status of Species at Risk in Ontario (COSSARO)/Ontario Ministry of Natural Resources (OMNR) assess the provincial status of wild species that are considered to be at risk in Ontario.

Extinct (EXT)	A species that no longer exists anywhere.
Extirpated (EXP)	A species that no longer exist in the wild in Ontario but still occurs elsewhere.
Endangered (Regulated) (END-R)	A species facing imminent extinction or extirpation in Ontario which has been regulated under Ontario's <i>Endangered Species Act</i> .
Endangered (END)	A species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's Endangered Species Act.
Threatened (THR)	A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.
Special Concern (SC)	A species with characteristics that make it sensitive to human activities or natural events.
Not at Risk (NAR)	A species that has been evaluated and found to be not at risk.
Data Deficient (DD)	A species for which there is insufficient information for a provincial status recommendations.

Local Status Niagara Haldimand (Riley 1989)

Species status within the Durham Region was used to determine local vascular plant status for the study area.

R-# = R- Native species present and rare; # - number of stations at which the species has been identified.

U = Uncommon

X = Not classified as rare or uncommon within Niagara Haldimand

APPENDIX D
TREE RESOURCES

Project: TA8917
 Client: _____ Date: June 14, 2019
 Collectors: LMC, JPP Area: Goodfellow Trail, Innisfil



Tree #	Scientific Name	Common Name	DBH (cm)	Additional Stems	CONDITION																	Tree Protection Measures					COMMENTS	
					TI	CS	CV	Radial Dripline (m)	Canopy Die Back (%)	Co-dominant stem	Included Bark	Lean, Dir.	Fungus	Insects	Cavity	Rot	Wound	Frost Crack	Epicormic	EAB	Canker	Tree Protection Zone (m)	Protect	Remove	Impact	ESA/SARA		
245	<i>Picea abies</i>	Norway spruce	17.0		g	g	g	4																5.00	x			
246	<i>Fraxinus sp.</i>	ash	10.0		g	g	g	2																3.00		x		
247	<i>Populus deltoides</i>	cottonwood	28.0		g	g	g	4											x				5.00	x				
248	<i>Salix sp.</i>	willow	10.0	8,7,8,10	g	g	f	4	30										x				5.00	x				
249	<i>Populus deltoides</i>	cottonwood	34.0		g	g	f	5	10										x				6.00	x				
250	<i>Populus tremuloides</i>	trembling aspen	11.0		g	g	g	2															3.00		x			
251	<i>Populus tremuloides</i>	trembling aspen	23.0		g	g	g	3															4.00		x			
252	<i>Populus tremuloides</i>	trembling aspen	12.0		g	g	g	2	10														3.00		x			
253	<i>Populus tremuloides</i>	trembling aspen	11.0		g	g	g	2	10														3.00		x			
254	<i>Populus tremuloides</i>	trembling aspen	20.0		g	g	g	4	10														5.00		x			
255	<i>Tilia americana</i>	basswood	27.0	10,11	g	g	g	4		x	x												5.00	x				
256	<i>Tilia americana</i>	basswood	25.0		g	g	g	3															4.00	x				
257	<i>Tilia americana</i>	basswood	17.0		g	g	g	2															3.00	x				
258	<i>Thuja occidentalis</i>	eastern white cedar	38.0		g	g	g	4	10														5.00	x				
259	<i>Tilia americana</i>	basswood	10.0		g	g	g	2											x				3.00	x				
260	<i>Thuja occidentalis</i>	eastern white cedar	28.0		g	g	g	4	30														5.00	x				
261	<i>Tilia americana</i>	basswood	17.0		g	g	g	2															3.00	x				
262	<i>Tsuga canadensis</i>	eastern hemlock	11.0		g	g	g	2															3.00	x				
263	<i>Fraxinus sp.</i>	ash	21.0		p	p	p	3															4.00	x				
264	<i>Tsuga canadensis</i>	eastern hemlock	12.0		g	g	g	2	30														3.00	x				
265	<i>Thuja occidentalis</i>	eastern white cedar	20.0		g	g	f	3	30														4.00	x				
266	<i>Thuja occidentalis</i>	eastern white cedar	21.0		g	g	f	3	30														4.00	x				
267	<i>Thuja occidentalis</i>	eastern white cedar	16.0		g	g	f	2	30														3.00	x				
268	<i>Thuja occidentalis</i>	eastern white cedar	22.0		g	g	f	4	30														5.00	x				
269	<i>Thuja occidentalis</i>	eastern white cedar	12.0		g	g	f	2															3.00	x				
270	<i>Tilia americana</i>	basswood	12.0	10.0	g	g	g	2															3.00	x				
271	<i>Tsuga canadensis</i>	eastern hemlock	11.0		g	g	g	2															3.00	x				
272	<i>Tilia americana</i>	basswood	23.0		g	g	g	3															4.00	x				
273	<i>Tsuga canadensis</i>	eastern hemlock	11.0		g	g	g	2	10														3.00	x				
274	<i>Thuja occidentalis</i>	eastern white cedar	10.0		g	g	f	2	10														3.00	x				
275	<i>Thuja occidentalis</i>	eastern white cedar	22.0		g	g	g	4															5.00	x				
276	<i>Tilia americana</i>	basswood	14.0		g	g	g	3											x				4.00	x				
277	<i>Tilia americana</i>	basswood	11.0	11.0	g	g	g	2		x	x												3.00	x				
278	<i>Betula papyrifera</i>	white birch	21.0		g	g	g	3															4.00	x				
279	<i>Betula papyrifera</i>	white birch	18.0		g	g	g	2															3.00	x				
280	<i>Acer x freemanii</i>	Freeman's maple	13.0		g	g	g	2															3.00	x				
281	<i>Thuja occidentalis</i>	eastern white cedar	25.0		g	g	f	3	30														4.00	x				
282	<i>Thuja occidentalis</i>	eastern white cedar	39.0		g	g	f	4	40														5.00	x				
283	<i>Thuja occidentalis</i>	eastern white cedar	36.0		g	g	f	4	40														5.00	x				
284	<i>Tilia americana</i>	basswood	21.0		g	g	g	3	10														4.00	x				

339	<i>Thuja occidentalis</i>	eastern white cedar	13.0		g	g	g	3													4.00	x			
340	<i>Thuja occidentalis</i>	eastern white cedar	12.0	12.0	g	g	g	3													4.00	x			
341	<i>Tilia americana</i>	basswood	36.0	18,20	g	g	g	4													5.00	x			
342	<i>Thuja occidentalis</i>	eastern white cedar	20.0	18,19,19	g	g	g	3													4.00	x			
343	<i>Thuja occidentalis</i>	eastern white cedar	21.0		g	g	f	3	30												4.00	x			
344	<i>Thuja occidentalis</i>	eastern white cedar	10.0		g	g	f	3	30												4.00	x			
345	<i>Thuja occidentalis</i>	eastern white cedar	22.0		g	g	f	4	30												5.00	x			
346	<i>Betula papyrifera</i>	white birch	22.0		g	g	g	4													5.00	x			
347	<i>Fraxinus nigra</i>	black ash	21.0		g	g	g	4													5.00	x			
348	<i>Thuja occidentalis</i>	eastern white cedar	22.0		g	g	g	4													5.00	x			
349	<i>Thuja occidentalis</i>	eastern white cedar	26.0		g	g	g	4													5.00	x			
350	<i>Thuja occidentalis</i>	eastern white cedar	11.0	10.0	g	g	g	2													3.00	x			
351	<i>Tilia americana</i>	basswood	11.0		g	g	g	2													3.00	x			
352	<i>Populus deltoides</i>	cottonwood	27.0		g	g	g	4													5.00	x			
353	<i>Ulmus americana</i>	white elm	16.0		g	g	g	2													3.00	x			
354	<i>Populus deltoides</i>	eastern cottonwood	35.0		g	g	g	4													5.00	x			
355	<i>Populus deltoides</i>	cottonwood	26.0	18.0	g	g	g	4													5.00	x			
356	<i>Populus deltoides</i>	cottonwood	18.0		g	g	g	3													4.00	x			
357	<i>Populus deltoides</i>	cottonwood	12.0		g	g	g	2													3.00	x			
358	<i>Populus deltoides</i>	cottonwood	25.0		g	g	g	3													4.00	x			
359	<i>Populus deltoides</i>	cottonwood	14.0		g	g	g	2													3.00	x			
360	<i>Populus deltoides</i>	cottonwood	12.0		g	g	g	2													3.00	x			
361	<i>Fraxinus nigra</i>	black ash	22.0		f	f	f	5													6.00	x			
362	<i>Picea glauca</i>	white spruce	12.0		g	g	g	2													3.00	x			
363	<i>Picea glauca</i>	white spruce	16.0		g	g	f	3	30												4.00	x			
364	<i>Thuja occidentalis</i>	eastern white cedar	22.0	12.0	p	f	f	3													4.00	x			
365	<i>Tilia americana</i>	basswood	30.0	18,20,16	g	g	g	6													7.00	x			
366	<i>Thuja occidentalis</i>	eastern white cedar	13.0		g	g	g	2													3.00	x			
367	<i>Populus balsamifera</i>	balsam poplar	32.0		g	g	g	4													5.00	x			
368	<i>Thuja occidentalis</i>	eastern white cedar	25.0		g	g	g	4													5.00	x			
369	<i>Tilia americana</i>	basswood	23.0	12.0	g	g	g	4													5.00	x			
370	<i>Thuja occidentalis</i>	eastern white cedar	6.0		g	g	g	6													7.00	x			
371	<i>Thuja occidentalis</i>	eastern white cedar	21.0		g	g	g	2													3.00	x			
372	<i>Thuja occidentalis</i>	eastern white cedar	22.0		g	g	g	2													3.00	x			
373	<i>Picea glauca</i>	white spruce	32.0		g	g	f	4													5.00	x			
374	<i>Thuja occidentalis</i>	eastern white cedar	11.0		g	g	g	4													5.00	x			
375	<i>Thuja occidentalis</i>	eastern white cedar	45.0		g	g	g	4													5.00	x			
376	<i>Thuja occidentalis</i>	eastern white cedar	47.0		g	g	g	4													5.00	x			
377	<i>Thuja occidentalis</i>	eastern white cedar	16.0		g	g	g	4													5.00	x			
378	<i>Thuja occidentalis</i>	eastern white cedar	20.0		g	g	g	4													5.00	x			
379	<i>Thuja occidentalis</i>	eastern white cedar	27.0		g	g	g	4													5.00	x			
380	<i>Fraxinus pennsylvanica</i>	red ash	28.0		f	f	f	3													4.00	x			
381	<i>Thuja occidentalis</i>	eastern white cedar	29.0		g	g	g	3													4.00	x			
382	<i>Thuja occidentalis</i>	eastern white cedar	24.0	22.0	g	g	g	3													4.00	x			
383	<i>Thuja occidentalis</i>	eastern white cedar	13.0		g	g	g	3													4.00	x			
384	<i>Picea glauca</i>	white spruce	40.0		f	f	f	4													5.00	x			
385	<i>Fraxinus nigra</i>	black ash	19.0		f	f	f	3													4.00	x			
386	<i>Thuja occidentalis</i>	eastern white cedar	30.0		f	f	f	4													5.00	x			
387	<i>Tilia americana</i>	basswood	33.0		g	g	g	5													6.00	x			
388	<i>Thuja occidentalis</i>	eastern white cedar	16.0		g	g	g	2													3.00	x			
389	<i>Tilia americana</i>	basswood	32.0		g	g	g	4													5.00	x			
390	<i>Thuja occidentalis</i>	eastern white cedar	14.0		g	g	f	2	30												3.00	x			
391	<i>Thuja occidentalis</i>	eastern white cedar	22.0		g	g	f	2													3.00	x			
392	<i>Thuja occidentalis</i>	eastern white cedar	23.0		g	g	f	3	30												4.00	x			

APPENDIX E
BREEDING BIRD SPECIES DOCUMENTED IN THE STUDY AREA BY LGL
(2019)

BREEDING BIRD SPECIES DOCUMENTED IN THE STUDY AREA BY LGL (2019)

Birds	Scientific Name	Common Name	SARA ¹	ESA ¹	Legal Status ¹	Other ¹	BBE	Station # ³
	<i>Charadrius vociferus</i>	Killdeer			MBCA		T	1
	<i>Zenaida macroura</i>	Mourning Dove			MBCA		T	1
	<i>Colaptes auratus</i>	Northern Flicker			MBCA		H	1
	<i>Myiarchus crinitus</i>	Great-crested Flycatcher			MBCA		T	1
	<i>Vireo olivaceus</i>	Red-eyed Vireo			MBCA	INT	S	1
	<i>Cyanocitta cristata</i>	Blue Jay			FWCA (P)		H	1
	<i>Corvus brachyrhynchos</i>	American Crow			MBCA		H	1
	<i>Poecile atricapillus</i>	Black-capped Chickadee			MBCA		T	1
	<i>Troglodytes aedon</i>	House Wren			MBCA		T, A	1
	<i>Turdus migratorius</i>	American Robin			MBCA		CF	1
	<i>Sturnus vulgaris</i>	European Starling			-		CF	1
	<i>Bombycilla garrulus</i>	Cedar Waxwing			MBCA		S	1
	<i>Dendroica petechia</i>	Yellow Warbler			MBCA		CF	1
	<i>Geothlypis trichas</i>	Common Yellowthroat			MBCA		T	1
	<i>Melospica melodia</i>	Song Sparrow			MBCA		T	1
	<i>Cardinalis cardinalis</i>	Northern Cardinal			MBCA		S	1
	<i>Agelaius phoeniceus</i>	Red-winged Blackbird			-		T, A	1
	<i>Quiscalus quiscula</i>	Common Grackle			-		T	1
	<i>Carduelis tristis</i>	American Goldfinch			MBCA		S	1
	<i>Passer domesticus</i>	House Sparrow			-		T	1

¹For definitions of species ranks, refer to **Appendix C**.

²BBE - Breeding Bird Evidence (according to Bird Studies Canada):

Possible Breeding: H - Species observed in its breeding season in suitable nesting habitat.
 S - Singing male present in its breeding season in suitable nesting habitat.

Probable Breeding:

T - Permanent territory presumed through registration of territorial song on at least two days, a week or so apart, at the same place.
A - Agitated behaviour or anxiety calls of an adult.

Confirmed Breeding:

NU - Used nest or egg shell found (occupied or laid within the period of study).
FY - Recently fledged young or downy young, including young incapable of sustained flight.
CF - Adult carrying food for young.
NE - Nest containing eggs.
NY - Nest with young seen or heard.

³Breeding Bird Point Count Station.

APPENDIX F
CORRESPONDENCE

**Goodfellow School Trail
Town of Innisfil**

Response to LSRCA – January 16, 2020

LSRCA Comments	Applicant Response (Jan. 16, 2020)	LSRCA Comments (Jan. 23, 2020)
<p>1. Please reduce the width of trail (boardwalk) through the natural areas (woodland, wetland) to minimize disturbance. This trail connection is identified in the Town’s Trails Master Plan as a secondary trail, which would have a minimum width requirement of 1.8m. If a width of 1.8m is not feasible, please provide additional justification for why the trail needs to be wider.</p>	<p>In talking with the Town, snow clearing and maintenance equipment need to access the path to keep it accessible during the winter for the school and public, as well as to generally maintain the path and boardwalk.</p> <p>A 1.8m width would be very tight given there are railings on either side of the boardwalk constraining the route. Further, as this trail services a school, there will be significant two-way traffic on the MUT which may include wheelchairs, scooters, bikes, etc.</p> <p>Current design guidance for over short distances identifies 2.4m as a minimum constrained width for a two-way multi-use path (see TAC Geometric Design Guide, Chapter 5, or OTM Book 18, pg. 115).</p> <p>Thus we propose a 2.5m clear width, which will translate to approx. 2.8m to 3.0m outside width.</p>	<p>A boardwalk width of 2.5m (inside), 2.8 – 3.0m (outside) is acceptable based on the provided justification that this trail is intended to function as a MUT. However, please ensure that vegetation clearing is limited to 4 m (3 m wide for the boardwalk and 0.5 m on each side, as is noted in the EIS)</p> <p>This boardwalk must be maintained in a way that does not require the application of salt. When selecting the surface material of the boardwalk, please consider choosing something that is rougher and provides some traction.</p>
<p>2. Please provide additional details/drawings that show how the boardwalk will be installed (helical piles? locations?).</p>	<p>A pair of support columns would be located every 8m or so. The support columns would be supported on concrete caissons drilled or hydrovac’d into the ground to a sufficient depth below frost and to stable ground, etc. This method of installation would cause very limited disturbance to roots and soils and it would be limited to the immediate area of the caissons.</p> <p>We will provide additional details showing the spacing of the columns.</p>	<p>Construction of the boardwalk should not require in-water works (as per the EIS). Please ensure all columns are located outside of the watercourse (bed and banks).</p>
<p>3. Vegetation clearing must be avoided between April 1 and October 31 to avoid impacts to birds protected under the <i>Migratory Bird Convention Act</i> and species at risk bats protected under the <i>Endangered Species Act</i>.</p>	<p>Understood. . . . given this restriction, and to avoid missing the construction season, the Town would like to remove the trees prior to April 1.</p> <p>What approval/permits are required for this to occur ??</p>	<p>A permit from LSRCA will be required for any work within the regulated area.</p> <p>Tree protection fencing and ESC measures must be in place prior to any vegetation clearing.</p>

<p>4. All other recommendations identified in the EIS (Section 5.0) must be implemented.</p>	<p>Understood.</p>	
<p>5. Please provide the following detailed drawings:</p> <ul style="list-style-type: none"> a. Construction Staging Plan showing the limit of disturbance, access routes, storage areas, etc. b. Erosion and Sediment Control Plan c. Tree Protection Plan d. Planting and Restoration Plan 	<p>With the above answers we will prepare these additional details. General comments to ensure we are making correct assumptions:</p> <ul style="list-style-type: none"> - The access route would be restricted to the area of the proposed trail plus a buffer on either side of say 1m. - Storage areas would be kept external to the wetland area. - Tree protection/Erosion control will be silt fence installed along the construction limits. 	<p>Detailed drawings will be required prior to issuance off a permit.</p>
	<p>6. <u>OTHER:</u></p> <ul style="list-style-type: none"> a. Aside from the LSRCA approval, would there be other permits/approvals required (MNR, DFO, MECP, etc.) ?? b. The Town is considering the type of surface/deck treatment for the boardwalk (e.g., wood, metal, concrete, etc.). While we don't believe the LSRCA would have comment on this, we thought we would ask to be sure and avoid delay – please advise. 	<p>If harm to species at risk (SAR), SAR habitat, fish or fish habitat is anticipated, additional approvals may be required from DFO, MNRF and/or MECP. Please contact these agencies directly to confirm.</p>
<p>Preliminary Engineering Comments:</p>		
<p>1. Conceptual design:</p> <ul style="list-style-type: none"> a. The proposed trail alignment is generally acceptable. However, provide an evaluation of the preferred and alternative option(s) to address the environmental, technical, flood hazard and other relevant requirements (e.g. safety). Please coordinate / confirm the design requirements with other disciplines (i.e. concerning trail width, location, tree inventory). b. Provide additional structural details of the proposed bridge crossing (i.e. use of piles, their spacing). Note that LSRCA generally does not support structures on poles. They may result in debris accumulation posing risk to the bridge structure and or downstream culvert crossing, hence potential increase in water levels during the flood event. 	<p>We will prepare.</p> <p>Given the length of the boardwalk There will be approx. five (5) pairs of columns. It is expected that the columns would pose less obstruction versus the existing vegetation and so flows would not be impeded.</p>	

<ul style="list-style-type: none"> c. Please examine the proposed crossing location / design with respect to the creek morphology. It appears that the creek is migrating (widening) to the north immediately downstream of the confluence with the SWM pond outlet. d. Identify erosion protection requirements (creek / structure) supported by respective analysis and recommendations (e.g. geotechnical, geomorphological). e. The LSRCA regulation mapping identifies spills during the Regulatory event from Leonard's Creek (#3) immediately to the north (9th Line). Please consider the spill flows in the overall bridge / site design (e.g. grading). 	<p>We will review.</p> <p>We will review.</p> <p>We will review.</p>	
<p>2. Hydraulics Design:</p> <ul style="list-style-type: none"> a. Provide an updated hydraulic model demonstrating that the crossing is sized and located such that there will be no increase in either upstream or downstream flooding or erosion. b. For any alternative design, ensure that proper clearance is provided between the bridge and the normal WL. 	<p>We will review.</p> <p>Okay</p>	
<p>3. Drawings:</p> <ul style="list-style-type: none"> a. Show HEC-RAS cross-sections and associate Regulatory and 100-year water levels. b. Show limits of the Regulatory and 100-year floodlines. c. Include grading details, survey information. d. Provide additional details concerning stream bank protection. e. Include additional details in support of the preferred design (e.g. location of the piles). f. Provide the Erosion and Sediment Control Plan, including construction staging and tree protection measures. 	<p>Okay</p>	
<p>4. Reporting:</p> <ul style="list-style-type: none"> a. Provide a design brief documenting the design and supportive analysis. 	<p>Okay</p>	

<ul style="list-style-type: none">b. Provide supplementary reports / documents; i.e. geotechnical report, erosion analysis / geomorphic recommendations concerning slope stability and or stream bank protection; environmental input, as required.c. Provide one set of the full size drawings.d. All drawings are to be folded (8.5 x 11).e. Reports and engineering drawings / details are to be signed and sealed by a Professional Engineer.f. Reports are to include a digital copy of applicable models on a Data CD or USB Thumb Drive.g. All submissions / reports are to include applicable technical components which achieve the minimum requirements outlined in the LSRCA Technical Guidelines for Stormwater Management Submissions, September 2016.		
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