Snell's Hollow East Secondary Plan Annual Wetland Monitoring Report – Year 1 (2019)

Snell's Hollow East Landowners Group
c/o Glenn Schnarr & Associates Inc.
700-10 Kingsbridge Garden Circle
Mississauga ON L5R 3K6

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January 22, 2020 (revised August 19, 2020)
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Record of Revisions

Revision	Date	Description
0	January 22, 2020	Initial Submission to Snell's Hollow East Landowners Group c/o GSAI
1	August 19, 2020	Final Submission addressing TRCA Comments

R.J. Burnside & Associates Limited

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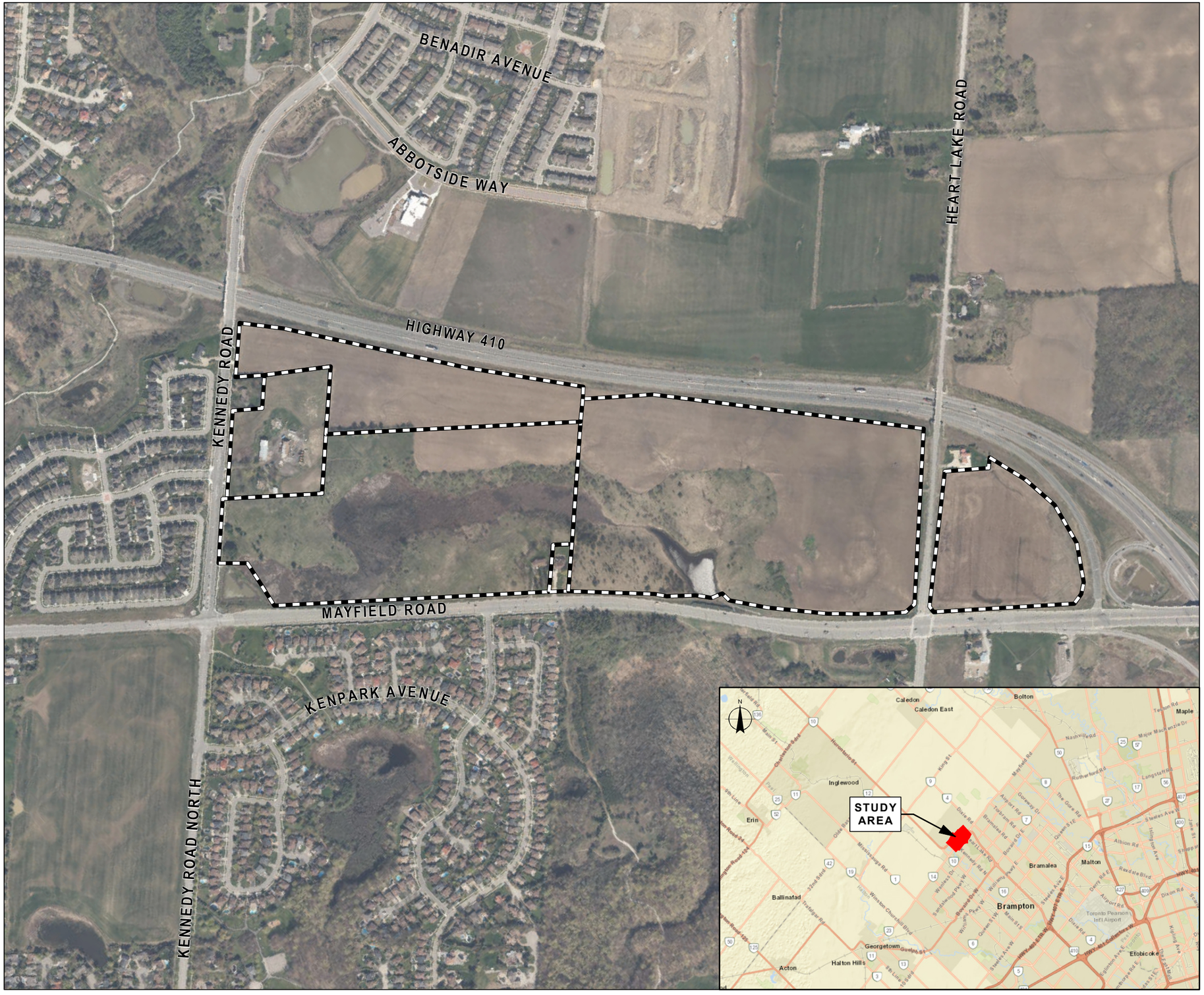
1.0 Introduction

R.J. Burnside & Associates Limited (Burnside) has been retained by the Snell's Hollow East Landowners Group to undertake an Environmental Field Study and Baseline Monitoring Program for a development located at the northeast corner of Kennedy Road and Mayfield Road (herein referred to as the "subject property"). The subject property is in the Town of Caledon (Town) and within the jurisdiction of Toronto and Region Conservation Authority (TRCA).

The subject property is located at the southern edge of the Town of Caledon, in the proposed Snell's Hollow East Secondary Plan area. The site is bounded by Highway 410 to the north, Heart Lake Road to the east, Mayfield Road to the south and Kennedy Road to the west (Figure 1).

As outlined in the Terms of Reference (TOR) dated April 8, 2019, the need for a Baseline Monitoring Program for the portion of the Heart Lake Provincially Significant Wetland (PSW) Complex (Wetland No. 1) that is present on the subject property was identified by the Town, the Region of Peel (Region) and the TRCA (grouped together and referred to as the Agencies). Wetland monitoring is to be completed for 1-year pre-development, 2 years during development, and for 3 years - every other year-post-development.

To satisfy these requirements, Burnside ecologists began collecting data on site in 2019 to establish monitoring parameters to help identify and assess the characteristics of the existing wetland located within the subject property. The purpose of this report is to present the results obtained from the first year of wetland monitoring conducted in 2019, described below. Burnside also completed vegetation community identification (Ecological Land Classification), identification of significant wildlife habitat and a review of relevant background natural heritage information and documentation. This information is summarized in the Snell's Hollow East Secondary Plan Baseline Conditions Report - 2019 (Burnside, 2019).



Study Area

Sources:

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SNELL'S HOLLOW LANDOWNER GROUP

Figure Title

SNELL'S HOLLOW EAST SECONDARY PLAN

STUDY AREA

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2.0 Wetland Monitoring Program Methodology

2.1 Background

The upland portions of the subject property primarily consist of rural residences and farm buildings, actively cultivated fields, cultural meadows, and woodland inclusions. A large portion of the subject property contains a Significant Valleyland system associated with the Unnamed Tributary of Spring Creek and the Heart Lake PSW Complex which drains beneath Mayfield Road towards Heart Lake Conservation Area to the south.

The Heart Lake Wetland Complex is composed of 40 ecologically linked wetland features that are located along the border shared between the City of Brampton and the Town of Caledon. The wetland is located on the headwater reaches of the Spring Creek subwatershed of the Etobicoke Creek watershed; most of the wetlands are hydrologically linked by watercourses within the complex (OMNR, 2009). The complex extends approximately 1 km north of Mayfield Rd south towards Bovaird Drive and is centered along Heart Lake Road. It is situated on and around the Brampton Esker, a feature that is comprised of kettle lakes, kettle peatlands and kettle wetlands. These features are rare within the Greater Toronto Area (GTA) and more typical of the Oak Ridges Moraine. As per the Heart Lake Wetland Complex evaluation (OMNR, 2009), each wetland within the complex has been numbered for referencing and reporting purposes. The largest wetland in the complex and an additional 14 smaller wetlands are contained within the Heart Lake Conservation Area, owned and managed by the TRCA.

Wetland No. 1 is located north of the Heart Lake Conservation Area, along Mayfield Road in between Kennedy Road and Heart Lake Road and is located wholly within the subject property limits. This wetland is approximately 7.53 ha in size. Water generally flows from the southeast to the northwest before crossing Mayfield Road and continuing southwest within Heart Lake Conservation Area. The wetland is bounded by Mayfield Road and cultured meadows to the southeast, agricultural fields to the northwest and northeast, and Kennedy Road to the southwest. A residential property also backs onto the wetland, extending from Mayfield Road towards the center of the wetland boundary. According to correspondence between the Ministry of Natural Resources (MNR) and the TRCA, boundary refinements of Wetland No. 1 and wetland boundary staking was conducted by the Aurora District MNRF staff and staff from the TRCA in 2011 and 2012. Additional vegetation communities were also noted during the wetland staking exercise. The updated wetland boundary limits were digitized and finalized in November 2012 (Varga, February 21, 2012, and Varga, November 23, 2012).

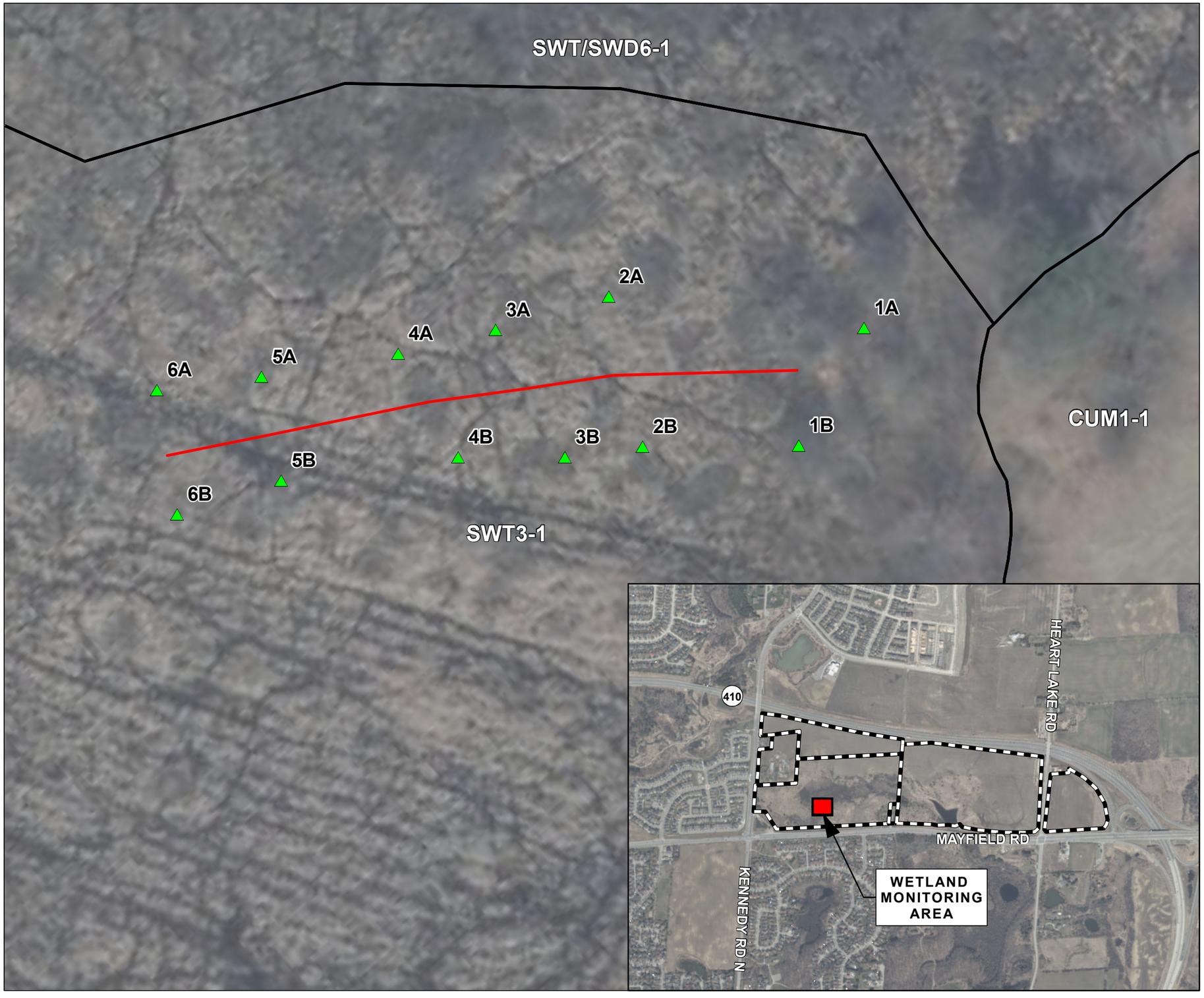
2.2 Wetland Vegetation Monitoring

Methodology for the wetland vegetation monitoring survey was based on the TRCA's Wetland Vegetation Monitoring Protocol, Terrestrial Long-term Fixed Plot Monitoring Program (January 2016).

On July 4, 2019, Burnside ecologists established a transect within an Alder Organic Thicket Swamp Type (SWT3-1) vegetation community that is part of Wetland No. 1, beginning at the edge of the wetland and extending towards its centre (refer to Figure 2). The wetland edge was determined by using methods outlined in the Ontario Wetland Evaluation Systems whereby the outer wetland boundary is drawn where 50% of the plant community consists of upland plant species (OWES Training and Certification, Nipissing University, June 2017). Once the transect was established, six centroids were established by installing wooden stakes at 10 m intervals along the transect beginning at the wetland edge. Effort was made to place six 2 m x 2 m woody plant subplots and 1 m x 1 m ground vegetation at 5 m southeast and 5 m northwest of each centroid. A wooden stake was installed in the center of each woody plant subplot and numbered to allow for subsequent visits to investigate the same locations. A GPS point was taken at each centroid and subplot, and a photograph was taken of each subplot for documentation purposes. For photos of each subplot, see Appendix A.

At each woody vegetation subplot, tree and shrub species were recorded per species by percent composition. Similarly, at each ground vegetation subplot, non-woody vegetation species (i.e., herbaceous, graminoid and grasses) were recorded and percent composition was estimated. This is a slight deviation from the TRCA's Wetland Vegetation Monitoring Protocol, Terrestrial Long-term Fixed Plot Monitoring Program to allow surveyors to capture all vegetation species within a subplot for a more complete botanical inventory. Soil analysis and depth to ground water was assessed at each centroid by using a soil auger to burrow a hole and acquire a soil profile sample. Following excavation of the hole and reasonable time to fill in with water, ground water level was determined by measuring the distance from the soil surface to the top of water. If applicable, the depth of organics was measured and recorded.

Once plant species within each subplot were identified, a Coefficient of Wetness (CO) was used to assess soil saturation levels. The CO defines the estimated probability for which a species is likely to grow in wetland or upland soils. Values between -5 and 5 are assigned to each species; -5 signifies a species most likely to be found in wetland soils and 5 signifies a species that is most likely to be found in dry, upland soils. Table 1 below defines CO values:



Vegetation Subplot

Transect Line

ELC Boundary

Study Area

ELC Descriptions
CUM1-1: Dry-Moist Old Field Meadow
SWD6-1: Red Maple Organic Deciduous Swamp
SWT: Thicket Swamp
SWT3-1: Alder Organic Thicket Swamp

Sources:

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SNELL'S HOLLOW LANDOWNER GROUP

Figure Title

SNELL'S HOLLOW EAST SECONDARY PLAN

WETLAND MONITORING

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Table 1: Definition of Coefficient of Wetness values[1]

Wetland Category	Symbol	Coefficient of Wetness	Definition
Upland	UPL	5	Occurs almost never in wetlands under natural conditions (estimated <1% probability).
Facultative Upland	FACU	3	Occasionally occurs in wetlands, but usually occurs in non-wetlands (estimated 1%-33% probability).
Facultative	FAC	0	Equally likely to occur in wetlands or non-wetlands (estimated 34%-66% probability).
Facultative Wetland	FACW	-3	Usually occurs in wetlands, but occasionally found in non-wetlands (estimated 67%-99% probability).
Obligate Wetland	OBL	-5	Occurs almost always in wetlands under natural conditions (estimated >99% probability).

The CO for each plant species was obtained by using the University of Michigan Flora Online website (found online at: https://michiganflora.net/search.aspx).

For the purposes of this report, a prism sweep was not conducted as part of this survey. Should the project move forward with a development plan, a prism sweep should be completed prior to the beginning of site alteration.

2.3 Amphibian Monitoring

Burnside staff conducted amphibian breeding call surveys following the Marsh Monitoring Program Participant's Handbook for Surveying Amphibians (Bird Studies Canada (BSC), during the 2019 breeding season. Surveys were conducted on April 24, May 15, and June 21, 2019 by qualified ecologists, to detect potential early, mid and late season amphibian breeding activity in Central Ontario.

Survey stations were chosen to provide information on potential amphibian breeding sites within representative wetland communities located throughout the subject property. Surveys were conducted at four stations (see Figure 3).

The Marsh Monitoring Program guidelines state that three call surveys should be completed when nighttime air temperatures are greater than 5°C, 10°C and 17°C, respectively, and when wind strength is less than 19 km/h (≤3 on the Beaufort Scale). Conditions during the surveys are outlined in Table 2 below.

[1] Table taken from *Floristic Quality Assessment: Development and Application in the State of Michigan (USA)* (Masters, et al., 1997) and modified for the purposes of this report.

Amphibian Monitoring Station

Provincially Significant Heart Lake Wetland Complex (MNRF)

Study Area

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SNELL'S HOLLOW EAST SECONDARY PLAN

AMPHIBIAN MONITORING STATIONS

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Table 2: Details of Amphibian Breeding Call Surveys Conducted by Burnside Staff

April 24, 2019	**Amphibian Breeding Call Survey #1**
Time (24h): 21:15	Air Temp (°C): 6.8
Sky Code[1]: 1	Wind Scale[2]: 2
May 15, 2019	**Amphibian Breeding Call Survey #2**
Time (24h): 21:27	Air Temp (°C): 12.5
Sky Code[1]: 1	Wind Scale[2]: 1
June 21, 2019	**Amphibian Breeding Call Survey #3**
Time (24h): 21:55	Air Temp (°C): 19
Sky Code[1]: 0	Wind Scale[2]: 2

[1] NAAMP/Beaufort Sky Codes: 0=clear (no cloud cover); 1=partly cloudy (scattered or broken) or variable; 2=cloudy or overcast; 3=sandstorm, duststorm or blowing snow; 4=fog, smoke, thick dust, or haze; 5=drizzle or light rain; 6=rain; 7=snow or snow/rain mix; 8=showers; 9=thunderstorms.

[2] Beaufort Wind Scale: 0=calm, smoke rises vertically (0-2 km/hr); 1=light air movement, smoke drifts (3-5); 2=slight breeze, wind felt on face; leaves rustle (6-11); 3=gentle breeze, leaves & twigs in constant motion (12-19); 4=moderate breeze, small branches moving, raises dust & loose paper (20-30); 5=fresh breeze, small trees begin to sway (31-39); 6=strong breeze, large branches in motion (40-50).

3.0 Wetland Monitoring Program Results

3.1 Wetland Vegetation Monitoring

Baseline vegetation and soil condition data was collected by Burnside ecologists on July 4, 2019. Given the significant slope from the upland habitat towards the wetland, the wetland edge was determined to be close to water's edge of the wetland. Therefore, the first two subplots, 1A and 1B, were dry and the remaining subplots contained at least some standing water.

Soil Assessment

Soil assessment took place in subplots 1A and 1B only as water was at or above soil in the remaining subplots along the transect. In both subplots, soil was dug to a depth of 90 cm. Water was present at 90 cm in subplot 1A and 60 cm in subplot 1B. No organics were present in either subplot. It was also noted that mottles were present at 35 cm, and gley was noted at 50 cm. Mottles and gley can act as significant indicators of soil saturation. Mottles indicate short periods of soil saturation and then oxidation (e.g., during periods of high rain or melting snow that are likely to occur in the spring). Gley indicates prolonged soil saturation or permanent ground water elevation. Using in-situ field testing techniques, soil texture was determined to be clay/loam.

Vegetation Assessment

A total of 23 vegetation species were identified in the subplots located along the transect, three of which were woody species and the remaining 20 were nonwoody/ground vegetation. All subplots were dominated by (i.e., greater than 50% composition by area) Facultative Wetland and Wetland Obligate species that have a CO between -3 and -5. Subplots 1A and 1B have the greatest number of plant species, all of which have a CO that ranges between 0 and -5. Subplot 6B was also found to have the same range in CO, however, only one species, Sensitive Fern (*Onoclea sensibilis*), has a CO of -3 and one species Bittersweet Nightshade (*Solanum dulcamara*) has a CO of 0. All other subplots contain species that are Facultative Wetland and Wetland Obligate species with a CO of -3 or -5 respectively. Subplots 3B, 4A and 5B were found to contain only Wetland Obligate species with a CO of -5. This shows that soil saturation levels and water retention throughout the transect are high, particularly in between Subplots 2A/2B and 5A/5B.

Broad-leaved Cattail (*Typha latifolia*) was the dominant species in all subplots, except 1A and 1B. Little evidence of the invasive Narrow-leaved Cattail (*Typha angustifolia*) or its hybrid form, *Typha x* glauca, was found within the subplots. However, *Typha x glauca* can be difficult to identify and may require genetic testing to confirm presence/absence. Purple Loosestrife (*Lythrum salicaria*), an aggressive invasive species that is native to Europe and Asia, was found in subplots 2A, 2B, 3B, 4A, 4B, 5B, 6A, and 6B. In all subplots where it was found, it's percent composition by area was

found to be moderately low (20% composition by area) to low (3% to 15% composition by area). Another aggressive invasive species, Reed Canary Grass (*Phalaris arundinacea subsp. aundinacea)* was found in moderate amounts in subplot 1B (45% compositions by area) and low amounts in subplots 5A and 6B (3% to 5% composition by area). Both Purple Loosestrife and Reed Canary Grass are escaped cultivars that were introduced to North America in the 1800s. Once established, they create dense stands and/or mats that crowd out native plant species leading to a reduction in plant diversity. They pose a threat to Ontario's wetland ecosystems, including marshes, fens, floodplains and wet prairies, as well as the wildlife that relies on those ecosystems for critical stages in their lifecycle (Anderson, 2012 and Warne, 2016).

Tufted Loosestrife (*Lysimachia thyrsiflora*), a native species that is rare within Peel Region (CVC, 2002) was found in low amounts (5% to 15% composition by area) in subplots 2B, 3A, 3B, and 5B.

A summary of the results for each transect can be found in the sections below. Unless otherwise noted, all common names were derived from the Database of Vascular Plants of Canada (VASCAN) website.

Subplot 1A

Subplot 1A is located at the edge of the wetland, approximately 5 m north of the centroid of the transect. At the time of the survey, it was characterized by tall shrubs and thick understory growth. The subplot was dominated by tall non-woody vegetation, including Bluejoint Reedgrass (*Calamagrostis canadensis*) and Sensitive Fern, both of which are native to Ontario. The CO of the plants found within the subplot ranged from 3 to -5. This was expected as this subplot was located at the edge of the wetland, which was determined by estimating the point at which 50% of the vegetation was comprised of wetland indicator species. A summary of the subplot 1A survey results can be found in Table 3.

Table 3: Summary of Vegetation Species Present in Subplot 1A

Woody Vegetation (2 m x 2 m)				
Common Name	**Scientific Name**	**Coefficient of Wetness**	**Composition %**	**Native/ Introduced**
Speckled Alder	*Alnus incana*	-3	100	Native
Ground Vegetation (1 m x 1 m)				
Common Name	**Scientific Name**	**Coefficient of Wetness**	**Composition %**	**Native/ Introduced**
Sensitive Fern	*Onoclea sensibilis*	-3	25	Native
Virginia Creeper	*Parthenocissus quiquefolia*	3	7	Native
Tall Buttercup	*Ranunculus acris*	0	5	Introduced

Ground Vegetation (1 m x 1 m)				
Common Name	**Scientific Name**	**Coefficient of Wetness**	**Composition %**	**Native/ Introduced**
Field Horesetail	*Equisetum arvens*	0	3	Native
Red Clover	*Trifolium pratense*	3	5	Introduced
Fox Sedge	*Carex vulpinoidea*	-5	5	Native
Common Agrimone	*Agrimonia gryposepala*	3	5	Native
Violet	*Viola sp.*		10	
Bluejoint Reedgrass	*Calamagrostis canadensis*	-5	35	Native

Subplot 1B

Subplot 1B is located at the edge of the wetland, approximately 5 m south of the centroid of the transect. The subplot contained thick ground vegetation which was dominated by Reed Canarygrass) and Bluejoint Reedgrass. Tall trees surrounded the subplot and provided some shade to the area. Only one woody vegetation species was found within the subplot: Common Buckthorn (*Rhamnus cathartica*). The CO of the plants found within the subplot ranged from 3 to -5. A summary of the subplot 1B survey results can be found in Table 4.

Table 4: Summary of Vegetation Species Present in Subplot 1B

Woody Vegetation (2 m x 2 m)				
Common Name	**Scientific Name**	**Coefficient of Wetness**	**Composition %**	**Native/ Introduced**
Common Buckthorn	*Rhamnus cathartica*	0	100	Introduced
Ground Vegetation (1 m x 1 m)				
Common Name	**Scientific Name**	**Coefficient of Wetness**	**Composition %**	**Native/ Introduced**
Aster	*Aster sp.*	N/A	5	
Virginia Creeper	*Parthenocissus inserta*	3	5	Native
Field Horesetail	Equisetum arvens	0	1	Native
Bluejoint Reedgrass	Calamagrostis canadensis	-5	30	Native
Reed Canary Grass[1]	*Phalaris arundinacea subsp. aundinacea*	-3	45	Introduced
Violet	*Viola sp.*		5	
Broad-leaved Cattail	*Typha latifolia*	-5	5	Native

Ground Vegetation (1 m x 1 m)				
Common Name	**Scientific Name**	**Coefficient of Wetness**	**Composition %**	**Native/ Introduced**
Bittersweet Nightshade	*Solanum dulcamara*	0	2	Introduced
Crested Sedge	*Carex cristatella*		2	Native

1 Name derived from the Ontario Invasive Plant Council document: Invasive Reed Canary Grass (Phalaris arundinacea subsp. arundinacea) Best Management Practices in Ontario (Anderson, 2012).

Subplot 2A

Subplot 2A contained dense ground vegetation that was dominated by Broad-leaved Cattail. No woody vegetation species were found in the subplot. The diversity of plant species is lower compared to subplots 1A and 1B as Cattails have begun crowding the area. Wetland obligate species dominated the subplot. Given the presence of water at the surface, saturation levels are expected to be very high. One facultative species (found in both wetlands and uplands) with a CO of 0 was found in the ground vegetation subplot; Bittersweet Nightshade. This species, and Purple Loosestrife, an aggressive invasive species, were the only two introduced species found within the subplot and together made 18% of species composition. The remaining three species are native to Ontario but made 82% of species composition due to the density of cattails. The CO of the plants found within the subplot ranged from 0 to -5. Water was visible at the surface at the time of the survey. A summary of the subplot 2A survey results can be found in Table 5.

Table 5: Summary of Vegetation Species Present in Subplot 2A

Woody Vegetation (2 m x 2 m)				
Common Name	**Scientific Name**	**Coefficient of Wetness**	**Composition %**	**Native/ Introduced**
N/A				
Ground Vegetation (1 m x 1 m)				
Common Name	**Scientific Name**	**Coefficient of Wetness**	**Composition %**	**Native/ Introduced**
Broad-leaved Cattail	*Typha latifolia*	-5	75	Native
Bittersweet Nightshade	*Solanum dulcamara*	0	8	Introduced
Purple Loosestrife	*Lythrum salicaria*	-5	10	Introduced
Harlequin Blueflag	*Iris versicolor*	-5	5	Native
Bulbet-bearing Waterparsnip	*Cicuta bulbifera*	-5	2	Native

Subplot 2B

Similar to Subplot 2A, Subplot 2B was densely vegetated and dominated by the native Broad-leaved Cattail. And again, due to the density of cattails, diversity of species was low with only four species found within the subplot. One species with a CO of 0, Bittersweet Nightshade, was found within this subplot. The remaining three species were wetland obligate species with a CO of -5. 75% of the vegetation found within the subplot was native due again to the density of cattail species, while 25% was introduced. No woody vegetation species were found within the subplot. Water was visible at the surface at the time of the survey. A summary of the subplot 2B survey results can be found in Table 6.

Table 6: Summary of Vegetation Species Present in Subplot 2B

Woody Vegetation (2 m x 2 m)				
Common Name	**Scientific Name**	**Coefficient of Wetness**	**Composition %**	**Native/ Introduced**
N/A				
Ground Vegetation (1 m x 1 m)				
Common Name	**Scientific Name**	**Coefficient of Wetness**	**Composition %**	**Native/ Introduced**
Broad-leaved Cattail	*Typha latifolia*	-5	70	Native
Bittersweet Nightshade	*Solanum dulcamara*	0	5	Introduced
Purple Loosestrife	*Lythrum salicaria*	-5	20	Introduced
Tufted Loosestrife	*Lysimachia thyrsiflora*	-5	5	Native

Subplot 3A

Subplot 3A did not contain introduced plant species at the time of the survey. As per subplot 2A and 2B, Broad-leaved cattails were the dominant ground vegetation species in subplot 3A, occupying 80% of the 1 m x 1 m plot. Common Winterberry (Ilex verticillate) was found growing on a mound in the northern corner of the 2 m x 2 m plot. It was the only woody vegetation species identified within the subplot. The CO of the plants found within the subplot ranged from -3 to -5. Water was visible at the surface at the time of the survey. A summary of the subplot 3A survey results can be found in Table 7, below.

Table 7: Summary of Vegetation Species Present in Subplot 3A

Woody Vegetation (2 m x 2 m)				
Common Name	**Scientific Name**	**Coefficient of Wetness**	**Composition %**	**Native/ Introduced**
Common Winterberry	*Ilex verticillata*	-3	100	Native
Ground Vegetation (1 m x 1 m)				
Common Name	**Scientific Name**	**Coefficient of Wetness**	**Composition %**	**Native/ Introduced**
Broad-leaved Cattail	*Typha latifolia*	-5	80	Native
Tufted Loosestrife	*Lysimachia thyrsiflora*	-5	15	Native
Northern Water-plantain	*Alisma triviale*	-5	5	Native

Subplot 3B

Subplot 3B was found to be dominated by wetland obligate, ground vegetation species, namely Broad-leaved Cattail. No woody vegetation species were found within this subplot. Only three plant species were identified in this subplot. Among those identified, Purple Loosestrife was the only introduced species, though it is an aggressive invasive species. The remaining two species, Broad-leaved Cattail and Tufted Loosestrife, are native to Ontario. Water was visible at the surface at the time of the survey. A summary of the subplot 3B survey results can be found in Table 8Table 7.

Table 8: Summary of Vegetation Species Present in Subplot 3B

Woody Vegetation (2 m x 2 m)				
Common Name	**Scientific Name**	**Coefficient of Wetness**	**Composition %**	**Native/ Introduced**
N/A				
Ground Vegetation (1 m x 1 m)				
Common Name	**Scientific Name**	**Coefficient of Wetness**	**Composition %**	**Native/ Introduced**
Broad-leaved Cattail	*Typha latifolia*	-5	85	Native
Purple Loosestrife	*Lythrum salicaria*	-5	8	Introduced
Tufted Loosestrife	*Lysimachia thyrsiflora*	-5	7	Native

Subplot 4A

Only two species were identified in subplot 4A: Broad-leaved Cattail and Purple Loosestrife. Both species tend to proliferate quickly and form dense colonies that crowd out other plant Subplot 4A species therefore it is not surprising that no other species were found in this subplot. Both species are wetland obligate species with a CO of -5. Broad-leaved Cattail are native to Ontario, while Purple Loosestrife is an aggressive invasive species. However, Broad-leaved Cattails were still found to be dominating the subplot with a composition of 80%. Water was visible at the surface at the time of the survey. A summary of the subplot 4A survey results can be found in Table 9.

Table 9: Summary of Vegetation Species Present in Subplot 4A

Woody Vegetation (2 m x 2 m)				
Common Name	**Scientific Name**	**Coefficient of Wetness**	**Composition %**	**Native/ Introduced**
N/A				
Ground Vegetation (1 m x 1 m)				
Common Name	**Scientific Name**	**Coefficient of Wetness**	**Composition %**	**Native/ Introduced**
Broad-leaved Cattail	*Typha latifolia*	-5	80	Native
Purple Loosestrife	*Lythrum salicaria*	-5	20	Introduced

Subplot 4B

Three species were found in subplot 4, two of which were ground vegetation species (Broad-leaved Cattail, Purple Loosestrife). Both ground vegetation species are wetland obligate species with a CO of -5. Broad-leaved cattail was the dominant species in the 1 m x 1 m ground vegetation plot. Only one woody vegetation species individual, Common Winterberry, was found within the subplot. It is a facultative wetland species with a CO of -3. Water was visible at the surface at the time of the survey. A summary of the subplot 4B survey results can be found in Table 10 below.

Table 10: Summary of Vegetation Species Present in Subplot 4B

Woody Vegetation (2 m x 2 m)				
Common Name	**Scientific Name**	**Coefficient of Wetness**	**Composition %**	**Native/ Introduced**
Common Winterberry	*Ilex verticillata*	-3	100	Native
Ground Vegetation (1 m x 1 m)				
Common Name	**Scientific Name**	**Coefficient of Wetness**	**Composition %**	**Native/ Introduced**
Broad-leaved Cattail	*Typha latifolia*	-5	80	Native
Purple Loosestrife	*Lythrum salicaria*	-5	20	Introduced

Subplot 5A

Subplot 5A saw an increase in species diversity compared to the adjacent 4A subplot with six species in total. One ground vegetation species found within the subplot, Marsh Fern (*Thlypteris palustris*), is a Facultative Wetland species with a CO of -3. The remaining ground vegetation species are wetland obligate species with a CO of -5. Common Winterberry was the only woody vegetation species found within the 2 m x 2 m woody vegetation plot. Water was visible at the surface at the time of the survey. A summary of the subplot 5A survey results can be found in Table 11.

Table 11: Summary of Vegetation Species Present in Subplot 5A

Woody Vegetation (2 m x 2 m)				
Common Name	**Scientific Name**	**Coefficient of Wetness**	**Composition %**	**Native/ Introduced**
Common Winterberry	*Ilex verticillata*	-3	100	Native
Ground Vegetation (1 m x 1 m)				
Common Name	**Scientific Name**	**Coefficient of Wetness**	**Composition %**	**Native/ Introduced**
Broad-leaved Cattail	*Typha latifolia*	-5	75	Native
Reed Canary grass	*Phalaris arundinacea subsp. arundinacea*	-5	3	Introduced
Harlequin Blueflag	*Iris versicolor*	-5	10	Native
Bulbet-bearing Waterparsnip	*Cicuta bulbifera*	-5	2	Native
Marsh Fern	*Thelypteris palustris*	-3	10	Native

Subplot 5B

Three ground vegetation species were found within subplot 5B, all of which are wetland obligate species with a CO of -5. As per the majority of subplots, Broad-leaved Cattail was the dominant species, encompassing 80% of the 1 m x 1 m ground vegetation plot. The remaining two species, Purple Loosestrife and Tufted Loosestrife, occupied 15% and 5% of the plot respectively. Water was visible at the surface at the time of the survey. No woody vegetation species were found within the 2 m x 2 m plot. A summary of the subplot 5B survey results can be found in Table 12.

Table 12: Summary of Vegetation Species Present in Subplot 5B

Woody Vegetation (2 m x 2 m)				
Common Name	**Scientific Name**	**Coefficient of Wetness**	**Composition %**	**Native/ Introduced**
N/A				
Ground Vegetation (1 m x 1 m)				
Common Name	**Scientific Name**	**Coefficient of Wetness**	**Composition %**	**Native/ Introduced**
Broad-leaved Cattail	*Typha latifolia*	-5	80	Native
Purple Loosestrife	*Lythrum salicaria*	-5	15	Introduced
Tufted Loosestrife	*Lysimachia thyrsiflora*	-5	5	Native

Subplot 6A

Subplot 6A was densely vegetated and dominated by Broad-leaved Cattails. Two species found identified in the subplot are facultative wetland species with a CO of -3. The remaining three species are wetland obligate species with a CO of -5. Only one, Purple Loosestrife, is an introduced species and it occupied 3% of the subplot at the time of the survey. Water was visible at the surface at the time of the survey. No woody vegetation species were identified within the 2 m x 2 m plot. A summary of the subplot 6A survey results can be found in Table 13, below.

Table 13: Summary of Vegetation Species Present in Subplot 6A

Woody Vegetation (2 m x 2 m)				
Common Name	**Scientific Name**	**Coefficient of Wetness**	**Composition %**	**Native/ Introduced**
N/A				
Ground Vegetation (1 m x 1 m)				
Common Name	**Scientific Name**	**Coefficient of Wetness**	**Composition %**	**Native/ Introduced**
Broad-leaved Cattail	*Typha latifolia*	-5	85	Native
Purple Loosestrife	*Lythrum salicaria*	-5	3	Introduced
Bulbet-bearing Waterparsnip	*Cicuta bulbifera*	-5	2	Native
Sensitive Fern	*Onoclea sensibilis*	-3	5	Native
Marsh Fern	*Thelypteris palustris*	-3	5	Native

Subplot 6B

Seven ground vegetation species were found in Subplot 6B. Broad-leaved cattail was found to be the dominant species, occupying 60% of the 1 m x 1 m plot. Two introduced species were identified; Purple Loosestrife and Bittersweet Nightshade. The remaining plant species are native to Ontario. The CO of the plants found within the subplot ranged from 0 to -5. No woody vegetation species were identified within the 2 m x 2 m plot. A summary of the subplot 6B survey results can be found in Table 14, below.

Table 14: Summary of Vegetation Species Present in Subplot 6B

Woody Vegetation (2 m x 2 m)				
Common Name	**Scientific Name**	**Coefficient of Wetness**	**Composition %**	**Native/ Introduced**
N/A				
Ground Vegetation (1 m x 1 m)				
Common Name	**Scientific Name**	**Coefficient of Wetness**	**Composition %**	**Native/ Introduced**
Broad-leaved Cattail	*Typha latifolia*	-5	60	Native
Purple Loosestrife	*Lythrum salicaria*	-5	15	Introduced
Bulbet-bearing Waterparsnip	*Cicuta bulbifera*	-5	1	Native
Sensitive Fern	*Onoclea sensibilis*	-3	5	Native
Marsh Fern	*Thelypteris palustris*	-3	10	Native
Bittersweet Nightshade	*Solanum dulcamara*	0	4	Introduced
Reed Canarygrass	*Phalaris arundinacea subsp. arundinacea*	-5	5	Introduced

3.2 Amphibian Monitoring

Three species, Wood Frog (*Lithobates sylvaticus)*, American Toad (*Anaxyrus americanus*) and Green Frog (*Lithobates clamitans*) were documented calling within the wetland stations on the first, second and third field visits. Results of the surveys are provided below in Table 15.

Table 15: Summary of Amphibian Survey Results

Station ID	Easting	Northing	Calls Heard	Common Name	Scientific Name	Call Code[1]
April 24, 2019						
1	17T 595248	4844311	Yes	Wood Frog	*Lithobates sylvaticus*	1
2	17T 595474	4844194	No	-	-	N/A
3	17T 595693	4844549	Yes	Wood Frog	*Lithobates sylvaticus*	1
4	17T 596068	4844844	No	-	-	N/A
May 15, 2019						
1	17T 595248	4844311	No	-	-	N/A
2	17T 595474	4844194	Yes	American Toad	*Anaxyrus americanus*	2
3	17T 595693	4844549	Yes	Wood Frog	*Lithobates sylvaticus*	1
4	17T 596068	4844844	Yes	American Toad	*Anaxyrus americanus*	3
June 21, 2019						
1	17T 595248	4844311	No	-	-	N/A
2	17T 595474	4844194	Yes	Green Frog	*Lithobates clamitans*	1
3	17T 595693	4844549	No	-	-	N/A
4	17T 596068	4844844	Yes	Green Frog	*Lithobates clamitans*	1

[1]Call Code	Code Description
1	Calls not simultaneous, number of individuals can be accurately counted.
2	Some calls simultaneous, number of individuals can be reliably estimated.
3	Full chorus, calls continuous and overlapping, number of individuals cannot be reliably estimated.

A total of five Wood Frogs, an undetermined number of American Toads, and six Green Frogs were heard calling at the different stations on the subject property during the 2019 breeding season. All three species are ranked as “secure” (S5) in Ontario. According to TRCA’s scoring and local ranking of fauna species in their jurisdiction, American Toad and Green Frog have a local rank of “L4” meaning they are a “Species of Urban Concern”; they occur throughout the region but could show declines if urban impacts are not mitigated effectively. Wood Frog has a local rank of “L2” meaning it is a “Species of Regional Conservation Concern”; they are somewhat more abundant and generally less sensitive than L1 species.

4.0 Incidental Observations

Incidental observations of wildlife were collected during field investigations. Observations were documented to provide a general characterization of the habitat functions of the site. Examples include tracks, scat, carcasses, live sightings, etc.

MNRFs provincial ranks (i.e., S1 to S5) are used to set protection priorities for rare species and natural communities. Four species observed incidentally are listed as secure (S5) or apparently secure (S4) in Southern Ontario. One species, Monarch (Danaus plexippus) is listed as Imperiled – Nonbreeding (S4N) and Apparently Secure - Breeding (S4B) Refer to Table 16 for a summary of incidental observations.

Table 16: Summary of Incidental Wildlife Observations on the Subject Property

Common Name	Scientific Name	Number Observed on Subject Property	S-Rank	SARO status	Comments
Birds					
Great Blue Heron	*Ardea herodias*	1	S4	-	Observed in shallow aquatic wetland (SAS1-1) in the northeast area of the subject property.
Red-winged Blackbird	*Agelaius phoeniceus*	1	S4	-	Observed during transect monitoring survey.
Mammals					
American Beaver	*Castor canadensis*	2	S5	-	Observed in shallow aquatic wetland (SAS1-1) in the northeast area of the subject property.
Herpetofauna					
Midland Painted Turtle	*Chrysemys picta marginata*	10	S4	-	Observed in shallow aquatic wetland (SAS1-1) in the northeast area of the subject property.
Lepidoptera					
Monarch	*Danaus plexippus*	6	S2N, S4B	Special Concern	Observed adults and larva in cultural field adjacent to shallow aquatic wetland in the northeast area of the subject property.

All species except Monarch are wetland specialists and rely on wetlands for at least one lifecycle process (i.e., foraging, breeding, rearing, etc.).

5.0 Conclusions

Burnside ecologists conducted wetland monitoring surveys during the spring and summer of 2019 to establish baseline monitoring conditions for the Snell's Hollow East Secondary Plan.

During initial data collection along the wetland transect, wetland facultative and wetland obligate species were found to dominate all subplot, except subplots 1A and 1B. Water was visible at the surface in all subplots, except again in subplots 1A and 1B. A soil assessment within at the fist centroid (0 m) found water at 60 cm below soil surface and mottles and gley at 35 cm and 50cm respectively. This data suggests that soil saturation levels within the wetland were elevated throughout the transect at the time of the survey.

Amphibian call surveys were completed in the spring and summer of 2019. A total of three amphibian species were heard calling at various stations throughout the subject property. Although all three species are common in Ontario, both American Toad and Green Frog are "Species of Urban Concern" and Wood Frog is a "Species of Regional Conservation Concern". Appropriate mitigation measures should be implemented during the construction and development phase in order to ensure that no negative impacts to these local populations occur.

The data collected during these surveys are to be used to assess the impacts of construction on the existing wetland and re-examine mitigation and impact prevention methods during and after development. Should the project move forward to a development phase, follow up surveys are to be completed for 2 years during construction, and for 3 years – every other year – post-development.

6.0 References

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BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix A

Wetland Vegetation Subplot Photos

Photo 1: Subplot 1A

Photo 2: Subplot 1B

Photo 3: Subplot 2A

Photo 4: Subplot 2B

Photo 5: Subplot 3A

Photo 6: Subplot 3B

Photo 7: Subplot 4A

Photo 8: Subplot 4B

No photo taken of subplot 5A

Photo 9: Subplot 5A

Photo 10: Subplot 5B

Photo 11: Subplot 6A

Photo 12: Subplot 6B