NATURAL HERITAGE REPORT

TESTON ROAD FROM 250 M WEST OF PINE VALLEY DRIVE TO KLEINBURG SUMMIT WAY

prepared for:

HDR

prepared by:

LGL LIMITED environmental research associates

CELEBRATING 50 YEARS

MARCH 2022

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TESTON ROAD FROM 250 M WEST OF PINE VALLEY DRIVE TO KLEINBURG SUMMIT WAY

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LGL Project # TA9006

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1.0 INTRODUCTION

The City of Vaughan has initiated a Schedule "C" Municipal Class Environmental Assessment (EA) study to assess potential transportation improvements to Teston Road from 250 m west of Pine Valley Drive to Kleinburg Summit Way, a distance of 2.1 km. The study will address transportation needs for those who live in the area and travel through it, including safety and operational improvements for all modes of transportation, like motor vehicles, public transportation, biking and walking.

HDR Inc. was retained by the City of Vaughan to lead the Municipal Class EA study. LGL Limited was retained by HDR Inc. to provide natural heritage services. The purpose of this report is to summarize existing natural heritage conditions found within the study area. This report uses information collected through secondary sources and detailed, multi-season field investigations conducted in 2020.

2.0 STUDY AREA

The study area for secondary source data collection includes lands located within 120 m of the Teston Road right-of-way from 250 m west of Pine Valley Drive to Kleinburg Summit Way. The study area for detailed, multi-season field investigations includes lands located within the Teston Road right-of-way and immediately adjacent lands. The study area is presented in **Figure 1**.

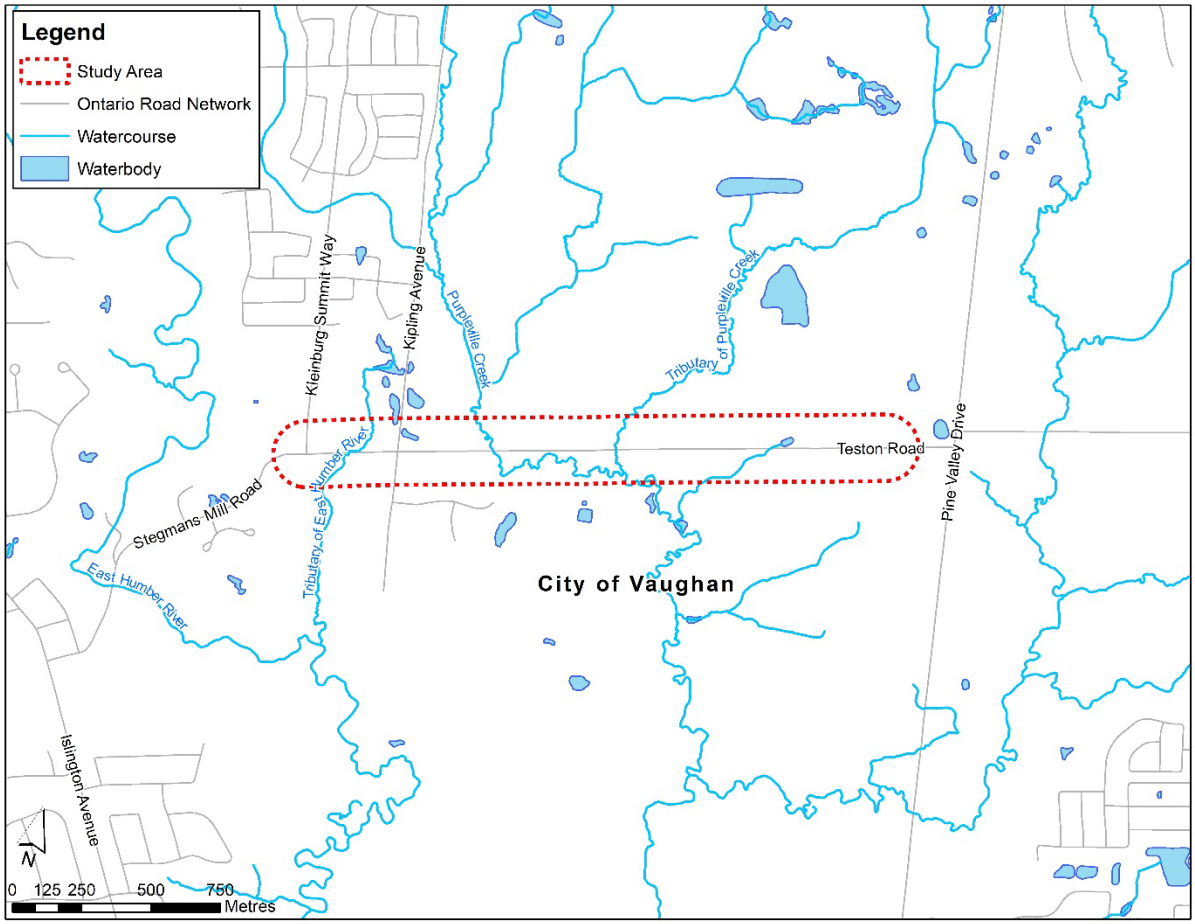


FIGURE 1. STUDY AREA

3.0 EXISTING CONDITIONS

This section describes the existing natural heritage conditions in the study area including: physiography, bedrock and surficial geology and soils; fish and fish habitat; vegetation and vegetation communities; wildlife and wildlife habitat; and, designated natural areas.

3.1 Physiography, Bedrock and Surficial Geology and Soils

3.1.1 Purpose

A secondary source investigation was undertaken to identify physiography, bedrock and surficial geology and agricultural soils within the study area.

3.1.2 Data Sources

Information regarding physiography, bedrock and surficial geology and agricultural soils within the study area was obtained through:

- Barnett, P.J., Cowan, W.R. and Henry, A.P. 1991. Quaternary geology of Ontario, southern sheet. Ontario, Geological Survey, Map 2556, scale 1:1 000 000
- Chapman, L.J. and D.F. Putnam. 1984. The Physiography of Southern Ontario. Published for the Ontario Geological Survey Special Volume 2;
- Ministry of Natural Resources and Forestry, Ontario GeoHub. 2019. Ontario Soil Survey Complex dataset;
- Ontario Ministry of Natural Resources. 1980. Ontario Geological Survey Quaternary Geology of Toronto and Surrounding Area Preliminary Map. Geological Services, Map 2204, scale 1:100 000;
- Toronto and Region Conservation Authority. 2008. Humber River Watershed Scenario Modelling and Analysis Report; and,
- White, O.L. 1975. Quaternary Geology of the Bolton Area, Southern Ontario; Ontario Division of Mines. Geological Report 117: (30 M/13), Maps 2275, 2276, scale 1 inch to 1 mile.

3.1.3 Findings

The study area is located within the South Slope physiographic region. The South Slope is characterized by low-lying, fine-grained, undulating ground moraine and knolls. The till is part of the Halton Till layer which has low permeability and groundwater infiltration is limited.

Bedrock geology comprises the Georgian Bay Formation consisting of interbedded grey-green to dark grey shale and fossiliferous calcareous siltstone to limestone of Upper Ordovician age.

The quaternary geology includes Halton Till comprised of brown loam to silt loam till glacial deposits, Modern Alluvium comprised of silt, sand and gravel fluvial deposits, Deltaic and Lacustrine Sand comprised of sand, some silt and gravel glaciolacustrine deposits, and Lacustrine-Wildfield Complex comprised of glaciolacustrine deposits of stratified or non-stratified silt loam, silty clay loam or clay deposits which may contain grits and pebbles, interbedded with till-like materials and often high in carbonate content (MRNF 2019). The Lacustrine-Wildfield Complex occurs as thin discontinuous veneer over Wildfield Till (deposits of glacial Lake Eversley) (MRNF 2019).

The agricultural soils found within the study area are a mix of different soils comprised of King Clay loam, Peel Clay, Bottom Land and Pontypool Sandy loam. Both King Clay loam and Pontypool Sandy loam soils are considered to drain well, while Peel Clay soils have 'imperfect' drainage, and Bottom Land soils have poor drainage, according to the Ontario Soil Survey Complex (MNRF 2019).

3.2 Fish and Fish Habitat

3.2.1 Purpose

A secondary source investigation and field surveys were carried out to characterize fisheries and aquatic ecosystems within the study area.

3.2.2 Data Sources

Information regarding fish and fish habitat within the study area was obtained through:

- Department of Fisheries and Oceans (DFO). 2020. Aquatic Species at Risk Maps. https://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html
- Ministry of Natural Resources and Forestry (MNRF). 2020. Natural Heritage Information Centre website (http://www.mnr.gov.on.ca/MNR/nhic/nhic.cfm). Ministry of Natural Resources. Peterborough, Ontario.
- Ministry of Natural Resources and Forestry (MNRF). 2020a. Ontario GeoHub (Land Information Ontario) database.
- Toronto and Region Conservation Authority (TRCA). 2008. Humber River Watershed Plan: Pathways to a Healthy Humber.
- Toronto and Region Conservation Authority (TRCA). 2005. Humber River Fisheries Management Plan.
- Toronto and Region Conservation Authority (TRCA). 2020. Fish collection records provided to study team.

LGL conducted a secondary source review to identify the fish community within the watersheds. The secondary source review included a species at risk screening though

aquatic species at risk mapping (DFO 2020) and the Natural Heritage Information Centre (NHIC) database (MNRF 2020). Background review also included the Land Information Ontario database (Ontario GeoHub; MNRF 2020a) Aquatic Resource Area (ARA) datasets. LGL also reviewed the Humber River Fisheries Management Plan (TRCA 2005) and the Humber River Watershed Plan (TRCA 2008). The fish species information for the watercourses compiled from these sources and incidental observations during field investigations is presented in **Table 1**.

An LGL field investigation was conducted on October 20, 2020. Weather conditions at the time of the investigation were partly cloudy, with winds at 10 km/h out of the north and an air temperature of 8°C. 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 watercourse crossings identified within the study area. The aquatic habitat description is presented below which describes existing conditions at each of the watercourse crossings and is summarized in **Table 2**. Representative photographs of the crossings were also taken during investigations and are provided in **Appendix B**.

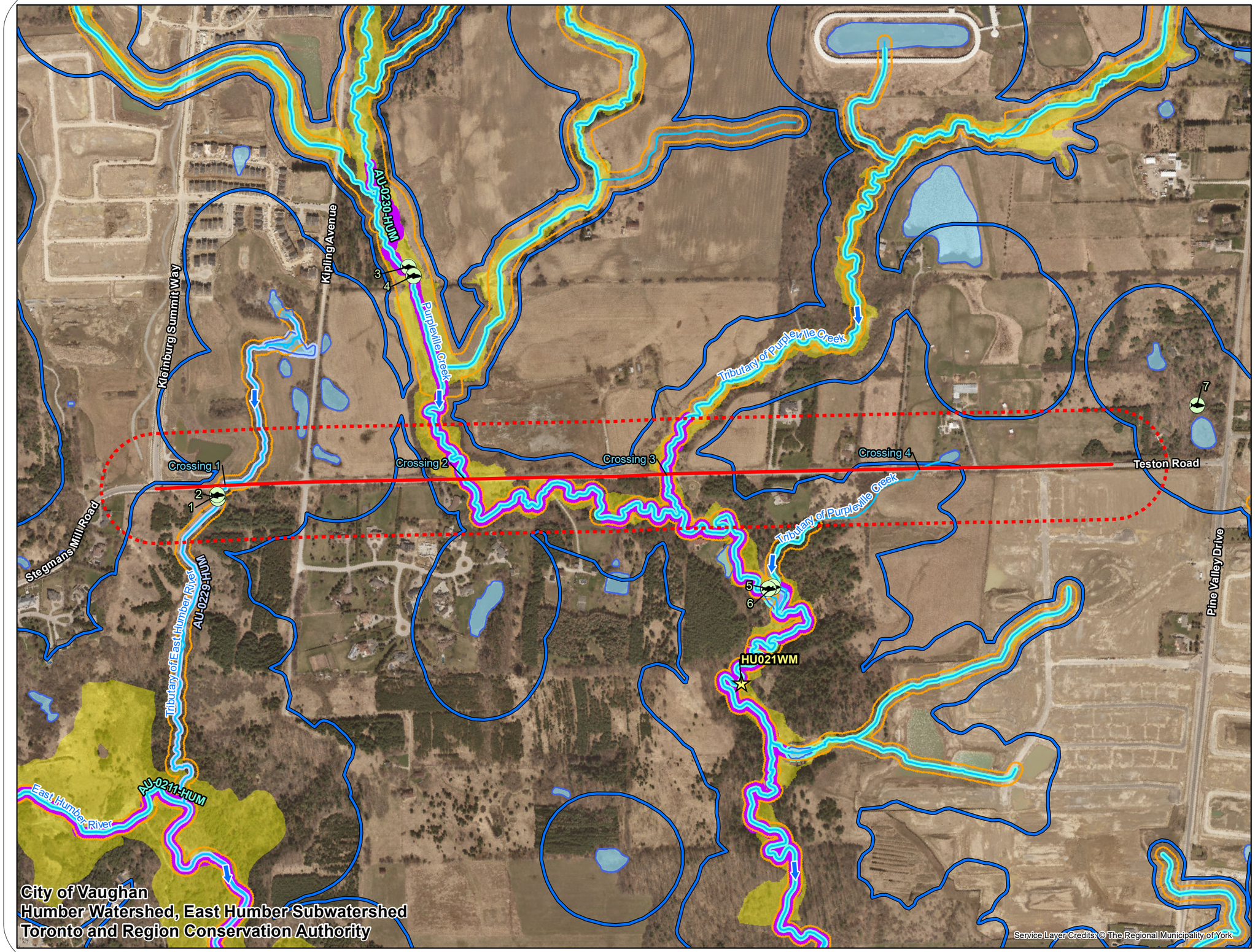
3.2.3 Findings

The study area is located in the East Humber River watershed and the Purpleville Creek and East – Nobleton to Kleinburg subwatersheds. All watercourses lie within the jurisdiction of the Toronto and Region Conservation Authority (TRCA) and the Ministry of Natural Resources and Forestry (MNRF), Aurora District Office. There are four watercourses that cross Teston Road within the study area including: Tributary of the East Humber River (Crossing 1); Purpleville Creek (Crossing 2); and, two Tributaries of Purpleville Creek (Crossings 3 and 4). The locations of all watercourses are presented in **Figure 2**.

TABLE 1.
HISTORICAL AND CURRENT FISH COLLECTION RECORDS WITHIN THE STUDY AREA

Scientific Name	Common Name	Crossing 1. Tributary of East Humber River	Crossing 2. Purpleville Creek	Crossing 3. Tributary of Purpleville Creek	Crossing 4. Tributary of Purpleville Creek	COSEWIC	SARA	ESA
Lethenteron appendix	American Brook Lamprey		x	x	x	-	-	-
Rhinichthys atratulus	Blacknose Dace	y	x, y	x, y	x, y	-	-	-
Luxilus cornutus	Common Shiner	y	x	x	x	-	-	-
Semotilus atromaculatus	Creek Chub	y	x, y	x	x	-	-	-
Cyprinidae	Unknown Minnow		x	x	x	-	-	-
Notropis atherinoides	Emerald Shiner		x	x	x	-	-	-
Pimephales promelas	Fathead Minnow		x, y	x, y	x, y	-	-	-
Notemigonus crysoleucas	Golden Shiner		x	x	x	-	-	-
Etheostoma nigrum	Johnny Darter	y	x	x	x	-	-	-
Cottus bairdii	Mottled Sculpin		x	x	x	-	-	-
Lepomis gibbosus	Pumpkinseed		x	x	x	-	-	-
Etheostoma caeruleum	Rainbow Darter	y	x	x	x	-	-	-
Catostomus commersonii	White Sucker	y	x, y	x, y	x, y	-	-	-
Pimephales notatus	Bluntnose Minnow	y	x, y	x, y	x, y	-	-	-
Luxilus cornutus	Common Shiner		x	x	x	-	-	-
Rhinichthys cataractae	Longnose Dace	y				-	-	-
Hypentelium nigricans	Northern Hog Sucker	y				-	-	-
Nocomis micropogon	River Chub	y				-	-	-
Ambloplites rupestris	Rock Bass	y				-	-	-
Notropis rubellus	Rosyface Shiner	y				-	-	-
Culaea inconstans	Brook Stickleback		y			-	-	-

Notes: x = TRCA (2020) Station HU021WM located DS of Teston Road and Crossings 2, 3 and 4 (2001, 2004)
y = MNRF (2020a) collection data from ARA sites including DS of Crossing 1 (13, 73, 91, 94), US of Crossing 2 (62, 98), and DS of Crossings 2, 3 and 4 (32, 79, 92)



LEGEND

- Study Area Centreline
- Study Area
- Water Flow Direction
- Watercourse
- Waterbody
- DFO SAR Distribution: Redside Dace
- Humber River Watershed Fisheries Monitoring (TRCA)
- Floodplain (TRCA)
- Meander Belt (TRCA)
- Regulation Limit (TRCA)

Aquatic Resource Area Summary

- ARA Survey Point
- Cold
- Cool

Data sources: Ministry of Natural Resources and Forestry, Fisheries and Oceans Canada, Toronto and Region Conservation Authority. Contains information licenced under the Open Government Licence - Ontario and Open Government Licence - Canada

0 60 120 240 360 m

N

Teston Road
Aquatic Ecology

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environmental research associates

Project:	TA9006	**Figure:**	2
Date:	October, 2020	**Prepared By:**	AJ
Scale:	1:8,000	**Verified By:**	GNK

TABLE 2.
EXISTING FISH HABITAT CONDITIONS SUMMARY TABLE

Watercourse	Flow*	Thermal Regime	Fish Habitat	Fisheries Management Zone/ Target Fish Species	Stream Morphology	Substrate Type	Riparian Vegetation	Species at Risk/ Critical Habitat Present	In Water Works Timing Window
East – Nobleton to Kleinburg Sub-watershed									
Crossing 1: Tributary of East Humber River	Permanent	Coolwater	Indirect	FMZ 3 Small Riverine Warmwater/Redside Dace, Redside Darter	US – Undefined wetland DS – Riffle/run, undefined wetland	US – Organic DS – Organic, silt, boulder and cobble	Grasses, Cattails, *Phragmites*	None	July 1 – September 15
Purpleville Creek Sub-watershed									
Crossing 2: Purpleville Creek	Intermittent	Coldwater-Coolwater	Direct	FMZ 4 Small Riverine Coldwater/Brook Trout, Redside Dace, Rainbow Trout	US – Likely riffles/runs DS – Runs with riffles	US - Clay with gravel, silt and detritus DS - Clay with gravel, silt and detritus	Grasses, Herbaceous, Cedar	Potential seasonal Redside Dace habitat	July 1 – September 15
Crossing 3: Tributary of Purpleville Creek	Intermittent	Coldwater-Coolwater	Direct	FMZ 4 Small Riverine Coldwater/Brook Trout, Redside Dace, Rainbow Trout	US – Runs DS - Runs	US - Gravel, cobble, boulder and silt DS – Silt and organic	Grasses, Shrubs, Herbaceous	Potential seasonal Redside Dace habitat	July 1 – September 15
Crossing 4: Tributary of Purpleville Creek	Ephemeral	Coldwater-Coolwater	Indirect	FMZ 4 Small Riverine Coldwater/Brook Trout, Redside Dace, Rainbow Trout	US – No defined channel DS – No defined channel	US – Organic DS - Organic	Grasses	None	July 1 – September 15

Notes: US – Upstream; DS - Downstream

TRCA (2005) reports that the Tributary of the East Humber River (Crossing 1) is found in Fisheries Management Zone 3, a small riverine warmwater thermal regime with Redside Dace and Rainbow Darter as target fish species. Purpleville Creek (Crossing 2) and its tributaries (Crossings 3 and 4) are found in Fisheries Management Zone 4, a small riverine coldwater thermal regime with Brook Trout, Redside Dace and Rainbow Trout as target fish species. The in-water works timing window is July 1 to September 15 for Crossings 1, 2, 3 and 4.

3.2.3.1 Crossing 1 – Tributary of East Humber River

This tributary of the East Humber River crosses Teston Road through a small diameter corrugated steel pipe (CSP) culvert approximately 175 m west of Kipling Avenue. This watercourse is conveyed through a relatively narrow valley corridor located approximately 50 m to the east of the crossing. This valley was historically located between two agricultural fields, but the west side has been developed with a large storm water management (SWM) pond and the area between the SWM facility and the valley has been naturalized/restored with plantings/seeding. The valley corridor upstream (north) of Teston Road is situated in a north-south direction and is fringed with deciduous trees. There is no defined channel within this area in the vicinity of Teston Road. Instead, water appears to be conveyed within a flat, wide (12-15 m) wetland located between the valley slopes. Substrates are entirely organic and soft, and surface flow is barely discernible. At the roadway, the feature ends in the roadside ditch and water travels within this ditch for 50 m before entering the culvert. The ditch is densely vegetated with grasses, cattails and Phragmites and there is no defined channel. At the upstream end of the culvert, there is a large diameter filter sock across the inlet that is approximately 30 cm high. There are no substrates within the culvert and water flow was very low.

Downstream of the culvert, there is a more defined channel that exists for approximately 40 m. It is approximately 40 cm wide and 5 cm deep. Substrates are organics mixed with silt and some boulder and cobble. Morphology is riffle/run. Approximately 35 m downstream, the channel is joined by flows coming from the SWM pond to the north. As such, water flow increases. At the end of the 40 m, the defined channel ends and flows enter meadow marsh habitat and become diffuse. The valley through which this watercourse travels appears to have been restored as a linear wetland. There are a series of elevation drops and pools separated by diffuse flow through marsh vegetation. The pools are relatively large (one pool is approximately 10 m wide and 30-40 cm deep). The elevation drops observed are up to 1 m in height with water cascading over bare clay. These drops form barriers to fish passage and no fish were observed anywhere within this watercourse.

As noted above, TRCA (2005) indicates that this watercourse provides coolwater habitat within the study area. Fish were not observed in the watercourse during the field investigation and it is likely that the habitat in the vicinity of Teston Road cannot be accessed by fish from downstream, where several species have been reported from historical surveys (see Table 1.) As such, this watercourse constitutes indirect fish habitat only.

3.2.3.2 Crossing 2 – Purpleville Creek

Purpleville Creek crosses Teston Road approximately 340 m east of Kipling Avenue through a short open-bottomed concrete culvert that appears to be in poor condition. There is no buffer between the active lanes of Teston Road and the inlet and outlet of the culvert. Upstream the watercourse exhibits a defined, but narrow (30-40 cm) channel. There was no flow during the time of the site visit. Instead, there were areas of standing water separated by dry patches. The valley through which the watercourse flow is wide and flat with the flood plain densely vegetated with grasses and herbaceous plant species. Substrates within the channel are comprised of clay with some gravel, silt and detritus.

There is a large pool of standing water within the culvert that spans the entire width (approximately 4 m) and is approximately 20 cm deep. Downstream, the pool ends within the culvert and water is concentrated in a narrow (1 m wide), shallow (10 cm) channel against the east (eroding) embankment. This narrow channel is approximately 4 m long at the end of which the channel widens and the watercourse bends to the southeast as it abuts a relatively narrower (compared with upstream) valley slope. The channel here is approximately 2 m wide and 10-15 cm deep. The riparian area consists of forest with cedars and deciduous tree species mixed. Substrates are similar to those found upstream. Banks are eroding throughout the reach examined. The water was not flowing, but morphology appears to be mainly runs with at least one small area of dry gravel that is likely riffle habitat. Further downstream the channel moves away from the valley slope and narrows (to 0.5 m) with substrates dominated by cobble and gravel. This type of habitat continues downstream with a meandering channel situated within a relatively narrow (approximately 4 m bankfull width) corridor with eroding, steep, but low (70 cm bankfull depth) banks. The channel contains many hummock of what appear to be sloughed off bank materials.

Further downstream (approximately 175 m to the east along Teston Road), Purpleville Creek abuts the base of the road slope just to the east of a driveway (5011 Teston Road), under which it travels. This channel in this area consists of pooled water with a 1-2 m wide wetted width. There appears to be a small riffle in one location, but then the pooled water continues downstream. Water depth is 15-30 cm. The riparian area consists of deciduous forest with a small grassy floodplain.

During LGL's field investigation no fish were observed anywhere within the areas surveyed. However, several species have been reported from historical records (**Table 1**) and this watercourse likely constitutes direct fish habitat with a coldwater to coolwater thermal regime.

3.2.3.3 Crossing 3 - Tributary of Purpleville Creek

This tributary of Purpleville Creek crosses Teston Road through an embedded, large diameter CSP culvert approximately 450 m east of Crossing 2. Upstream the inlet of the culvert is located at the fenceline between the right-of-way and private land. As such, there is a buffer of vegetated slope between the edge of the roadway and the watercourse. The channel is relatively narrow (0.5 - 0.75 m wide) and shallow (5 cm deep). At the fenceline old wood fencing material has partially blocked flows and created a small pool upstream (1.5 m wide, 30 cm deep) with a small riffle leading into it. Upstream of this pool, the channel is incised within short (20 cm), steep banks within an open valley. Morphology is mainly runs. Riparian vegetation consists of cultural meadow with sparsely scattered shrubs. There is much overhanging vegetation. Substrates are mainly coarse and consists of gravel, cobble, boulder and silt. Bankfull width is estimated at 1 m and bankfull depth at 40 cm. Instream vegetation consist of grasses and cover is provided by overhanging and instream vegetation.

Within the culvert, water is pooled. Downstream of the crossing, the valley is narrower and treed with mixed species. There is a manicured yard to the east. The floodplain is well-vegetated with cultural meadow and meadow marsh species. The channel is very narrow (0.3 m) and shallow (10 cm) and consists solely of run habitat. Instream vegetation emergent and overhanging vegetation provides cover and the banks are relatively flat. Bankfull width is larger here than upstream (6 m), but bankfull depth remains the same (40 cm). Substrates are fine in the area investigated (silt and organics).

No fish were observed during the fisheries investigation. However, several species were reported historically from this watercourse (see **Table 1**). It is likely that this watercourse supports direct fish habitat with a coldwater to coolwater thermal regime.

3.2.3.4 Crossing 4 - Tributary of Purpleville Creek

This feature crosses Teston Road through a small diameter CSP culvert approximately 650 m west of Pine Valley Drive. It conveys water from a small dug pond located on the north side of Teston Road that overflows into the roadside ditch. At the time of the site visit, this pond exhibited low-water conditions and appeared to be at least 1.5 m below its high-water level, as evidenced by the bare banks. The ditch and culvert were dry during the site visit and there was no evidence of recent flows. Downstream of the

crossing, any drainage that is conveyed across the road travels down a relatively wide, grassy swale toward the tributary of Purpleville Creek that crosses at Crossing 3. The slope is relatively steep here and there is no defined channel. It is likely that this feature conveys surface drainage and pond overflow only. It was noted that the large land development that is occurring to the east has an outlet just to the east of the crossing on the south side of Teston Road. As such, this feature will receive input from storm water management facilities within this development in the future.

This drainage feature does not constitute fish habitat in the vicinity of Teston Road. However, it does flow into direct fish habitat downstream and fish have been reported from the area at the confluence of this feature and the tributary of Purpleville Creek. A full list of species captured at the confluence mentioned above is presented in **Table 1**.

3.2.4 Species at Risk

The NHIC database (MNRF 2020) and the DFO Aquatic Species at Risk mapping (DFO 2020) indicate that Purpleville Creek (Crossing 2) and its tributary (Crossing 3) are habitat for Redside Dace. If these watercourses are occupied habitat, these areas are likely only seasonally used by this species as Purpleville Creek has intermittent flows and the tributary has limited habitat.

3.3 Vegetation and Vegetation Communities

3.3.1 Purpose

The geographical extent, composition, structure and function of the vegetation communities were identified through air photo interpretation and field investigations. Air photos were interpreted to determine the limits and characteristics of the vegetation communities in the study area. Multi-season botanical field investigations were undertaken within the study area on June 11, July 22 and August 28, 2020. The field investigations of the vegetation communities were undertaken within the Teston Road right-of-way and adjacent habitat, to the extent possible.

The vegetation communities were classified according to the *Ecological Land Classification for Southern Ontario: First Approximation and Its Application* (Lee *et al*. 1998). A plant list and a description of the general structure of vegetation were obtained during the field investigations. Plant species status was reviewed for Ontario (Oldham 2009), York Region (Riley 1989 and Varga 2000), and the Toronto and Region Conservation Authority (TRCA 2009). Vascular plant nomenclature follows Newmaster *et al*. (1998) with a few exceptions that have been updated to Newmaster *et al.* (2005).

3.3.2 Data Sources

- Lee, H., W. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig, and S. McMurray. 1998. *Ecological Land Classification for Southern Ontario: First Approximation and Its Application*. Natural Heritage Information Centre;

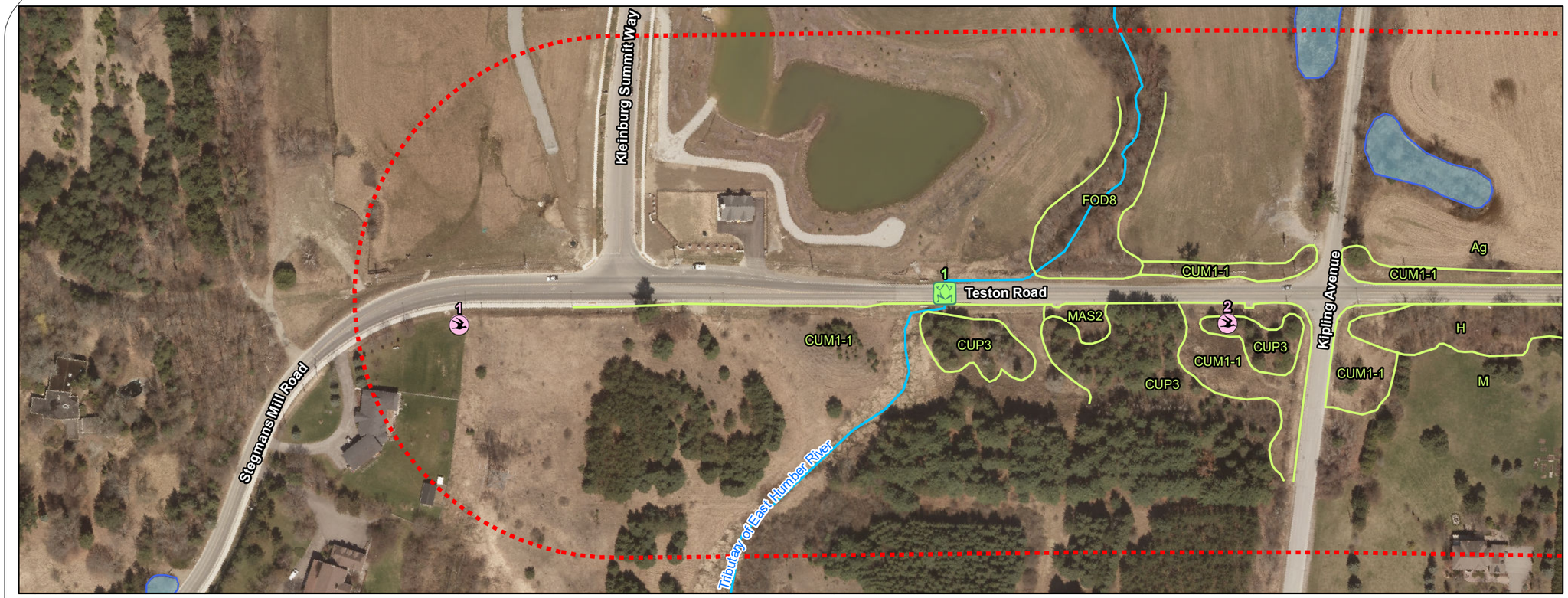
- Newmaster, S.G., A. Lehela, P.W.C. Uhlig, S. McMurray and M.J. Oldham. 1998. *Ontario Plant List*. Ontario Ministry of Natural Resources, Ontario Forest Research Institute, Sault Ste. Marie, Ontario, Forest Research Information Paper No. 123, 550 pp. + appendices;
- Newmaster, S.G. 2005. *Flora Ontario - Integrated Botanical Information System (FOIBIS)* 2006 species scientific names obtained March 2007 from the University of Guelph;
- Oldham, M.J. 2009. *Natural Heritage Resources of Ontario: Rare Vascular Plants.* Natural Heritage Information Centre, Ontario Ministry of Natural Resources, Peterborough, Ontario;
- Ontario Ministry of Natural Resources and Forestry. 2020. *Natural Heritage Information Centre*. Website available online at: https://www.ontario.ca/environment-and-energy/natural-heritage-information-centre. Accessed June 2017, Ministry of Natural Resources and Forestry. Peterborough, Ontario;
- Riley, J.L. 1989. *York Region: Distribution and Status of the Vascular Plants of Central Region:* Ontario Ministry of Natural Resources. Richmond Hill, Ontario;
- Toronto and Region Conservation Authority. 2009. *Flora Scores and Ranks*; and,
- Varga, S et al. 2000. *Regional Municipality of York Distribution and Status of the Vascular Plants of the Greater Toronto Area.*

3.3.3 Findings

3.3.3.1 Vegetation Communities

Vegetation communities located within the study area consist of a mixture of wetland, forest and cultural communities. A total of eleven Ecological Land Classification (ELC) vegetation community types were identified within the study area including: Open Aquatic (OAO), Mineral Shallow Marsh (MAS2), Meadow Marsh (MAM), Mixed Forest (FOM), Fresh-Moist Poplar-Sassafras Deciduous Forest (FOD8), Fresh-Moist Lowland Willow Deciduous Forest (FOD7-3), Coniferous Forest (CUP3), White Pine Coniferous Forest (CUP3-2), Dry-Moist Old Field Meadow (CUM1-1), Mineral Cultural Woodland (CUW1), and Mineral Cultural Thicket (CUT1). All of the vegetation communities identified within the study area are considered widespread and common in Ontario and are secure globally. These communities are delineated in **Figures 3a, b** and described in **Table 3.**

FIGURE 3A. TERRESTRIAL ECOLOGY



LEGEND

- Amphibian Monitoring Station
- Bird Monitoring Station
- Watercourse
- Waterbody
- Study Area

Vegetation Community

- Vegetation Community Boundary

Ag	Agriculture
CUM1-1	Dry-Moist Old Field Meadow Type
CUP3	Coniferous Plantations
CUP3-2	White Pine Coniferous Plantation Type
CUT1	Mineral Cultural Thicket Ecosite
CUW1	Mineral Cultural Woodland Ecosite
FOD7-3	Fresh-Moist Willow Lowland Deciduous Forest Type
FOD8	Fresh-Moist Poplar-Sassafras Deciduous Forest Ecosite
FOM	Mixed Forest
H	Hedgerow
M	Manicured
MAM	Meadow Marsh
MAS2	Mineral Shallow Marsh Ecosite
OAO	Open Aquatic

Data sources: LGL Limited field surveys, Ministry of Natural Resources and Forestry, Contains information licenced under the Open Government Licence - Ontario.

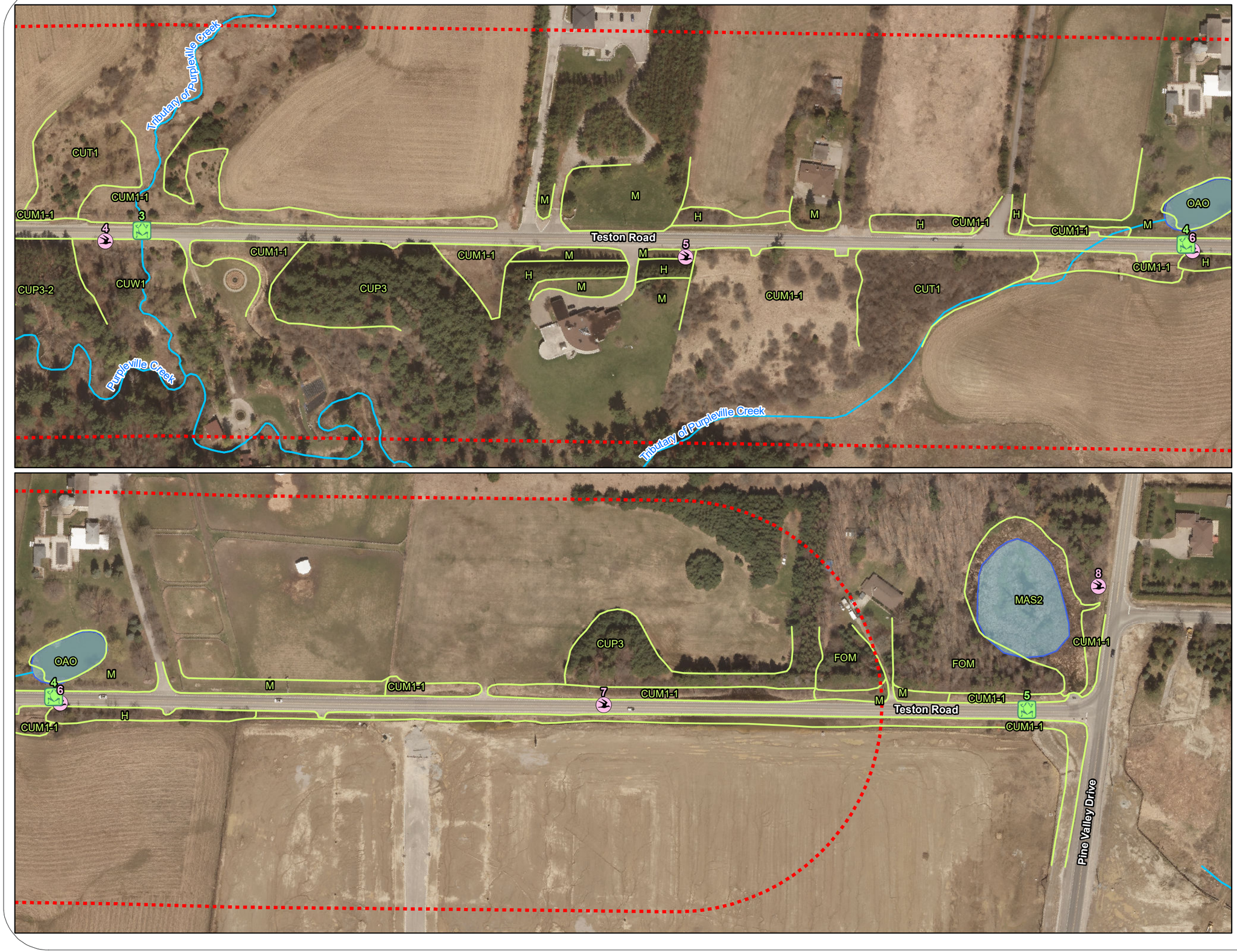
0 15 30 60 90 m

N

Teston Road
Terrestrial Ecology

LGL LIMITED
environmental research associates

Project:	TA9006	**Figure:**	3a
Date:	October, 2020	**Prepared By:**	AJ
Scale:	1:2,100	**Verified By:**	GNK



LEGEND

- Amphibian Monitoring Station
- Bird Monitoring Station
- Watercourse
- Waterbody
- Study Area

Vegetation Community

- Vegetation Community Boundary

Ag	Agriculture
CUM1-1	Dry-Moist Old Field Meadow Type
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CUP3-2	White Pine Coniferous Plantation Type
CUT1	Mineral Cultural Thicket Ecosite
CUW1	Mineral Cultural Woodland Ecosite
FOD7-3	Fresh-Moist Willow Lowland Deciduous Forest Type
FOD8	Fresh-Moist Poplar-Sassafras Deciduous Forest Ecosite
FOM	Mixed Forest
H	Hedgerow
M	Manicured
MAM	Meadow Marsh
MAS2	Mineral Shallow Marsh Ecosite
OAO	Open Aquatic

Data sources: LGL Limited field surveys, Ministry of Natural Resources and Forestry, Contains information licenced under the Open Government Licence - Ontario.

0 15 30 60 90 m

N

Teston Road
Terrestrial Ecology

LGL LIMITED
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Project:	TA9006	**Figure:**	3b
Date:	October, 2020	**Prepared By:**	AJ
Scale:	1:2,100	**Verified By:**	GNK

TABLE 3.
SUMMARY OF ECOLOGICAL LAND CLASSIFICATION VEGETATION COMMUNITIES

ELC Code	Vegetation Type	Species Association	Community Characteristics
TERRESTRIAL – NATURAL/SEMI-NATURAL			
FOD	Deciduous Forest		
FOD7-3	Fresh-Moist Lowland Willow Deciduous Forest	**Canopy:** includes crack willow (*Salix fragilis*), trembling aspen (*Populus tremuloides*), red ash (*Fraxinus pennsylvanica*), Manitoba maple (*Acer negundo*), and white elm (*Ulmus americana*). **Understory:** includes peach-leaved willow (*Salix amygdaloides*), common buckthorn (*Rhamnus carhartica*), crack willow, and eastern white cedar (*Thuja occidentalis*). **Ground cover:** includes sensitive fern (*Onoclea sensibilis*), Canada goldenrod (*Solidago canadensis*), coltsfoot (*Tussilago farfara*), and wild lily-of-the-valley (*Maianthemum canadense*).	• Tree cover > 60 % (FO). • Deciduous trees > 75 % of canopy cover (D). • Middle to lower slopes, seepage areas and bottomlands topographic positions (7). • Willow dominant (-3).
FOD8	Fresh-Moist Poplar-Sassafras Deciduous Forest	**Canopy:** includes trembling aspen (*Populus tremuloides*), white elm and basswood (*Tilia americana*). **Understory:** includes trembling aspen, Manitoba maple, chokecherry (*Prunus virginiana* var. *virginiana*). **Ground cover:** includes dame's rocket (*Hesperis matronalis*), yellow avens (*Geum aleppicum*), Canada goldenrod, and yellowish enchanter's nightshade (*Ciraea lutetiana* ssp. *canadensis*).	• Tree cover > 60 % (FO). • Deciduous trees > 75 % of canopy cover (D). • Sites dominated by trembling aspen, large tooth aspen or sassafras (8).
FOM	Mixed Forest		
FOM	Mixed Forest	**Canopy:** includes Norway spruce (*Picea abies*), eastern white pine (*Pinus nigra*), red ash, white ash (*Fraxinus americana*), and sugar maple (*Acer saccharum* var. *saccharum*). **Understory:** includes eastern white cedar, Norway spruce, choke cherry, and ironwood (*Ostrya virginiana*). **Ground Cover:** includes Canada goldenrod, garlic mustard (*Alliaria petiolate*), herb-robert (*Geranium robertianum*), awnless brome (*Bromus inermis* ssp. *inermis*), and may-apple (*Podophyllum peltatum*).	• Tree cover > 60 % (FO). • Coniferous trees > 25 % and deciduous trees > 25 % of canopy cover (M).

TABLE 3.
SUMMARY OF ECOLOGICAL LAND CLASSIFICATION VEGETATION COMMUNITIES

ELC Code	Vegetation Type	Species Association	Community Characteristics
TERRESTRIAL – CULTURAL			
CUM	Cultural Meadow		
CUM1-1	Dry-Moist Old Field Meadow	**Emergent Trees/Shrubs**: includes hawthorns (*Crataegus* sp.), staghorn sumac (*Rhus hirta*), and Tartarian honeysuckle (*Lonicera tatarica*). **Ground cover:** includes wild carrot (*Daucus carota*), reed canary grass, tall goldenrod (*Solidago canadensis* var. *scabra*), awnless brome, Canada thistle (*Cirsium canadense*), and New England aster (*Symphyotrichum novae-angliae*).	• Cultural communities (CU). • Tree cover and shrub cover < 25 % (M). • This community can occur on a wide range of soil moisture regimes (Dry-Moist) (-1).
CUT	Cultural Thicket		
CUT1	Mineral Cultural Thicket	**Canopy:** includes large-fruited thorn (*Crataegus punctata*), trembling aspen, white poplar (*Populus alba*), and eastern white cedar. **Understory:** includes hawthorn species (*Crataegus* spp.), common apple (*Malus pumila*), staghorn sumac, and common buckthorn. **Ground cover:** includes Canada goldenrod, Kentucky blue grass (*Poa pretensis* ssp. *pratensis*), garlic mustard, New England aster, and awnless brome.	• Cultural communities (CU). • Tree cover <25% shrub cover >25% (T). • Mineral soil (1).
CUP3	Coniferous Plantation		
CUP3		**Canopy:** includes eastern white pine, red pine (*Pinus resinosa*), white spruce (*Picea glauca*), and European larch (*Larix decidua*). **Understory:** includes common buckthorn, staghorn sumac, and red ash. **Ground cover:** includes common garlic mustard, yellow avens, herb-robert, wild carrot and, common dandelion (*Taraxacum officinale*).	• Cultural communities (CU). • Plantation (P). • Coniferous tree cover >75% of canopy cover (3).
CUP3-2		**Canopy:** includes eastern white pine, red pine, and white spruce. **Understory:** includes hawthorns. **Ground Cover:** includes tall goldenrod, heart-leaved aster (*Symphyotrichum cordifolium*), herb-robert and yellowish enchanter's nightshade.	• Cultural communities (CU). • Plantation (P). • Coniferous tree cover >75% of canopy cover (3). • White pine dominant (-3).

TABLE 3.
SUMMARY OF ECOLOGICAL LAND CLASSIFICATION VEGETATION COMMUNITIES

ELC Code	Vegetation Type	Species Association	Community Characteristics
CUW	Cultural Woodland		
CUW1	Mineral Cultural Woodland	**Canopy:** includes eastern white pine, white spruce and red pine. **Understory:** includes hawthorns, common buckthorn, and choke cherry. **Ground cover:** includes herb-robert, heart-leaved aster, awnless brome and tall goldenrod.	• Cultural communities (CU). • 25 % < tree cover < 35 % • Mineral Soil (1).
WETLAND			
MAS	Shallow Marsh		
MAS2		**Emergent Trees/Shrubs:** includes long-beaked willow (*Salix bebbiana*). **Ground cover:** includes cattail species (*Typha* spp.), small-fruited bulrush (*Scirpus microcarpus*), Canada goldenrod, spotted-touch-me know (*Impatiens canpensis*), and tussock sedge (*Carex stricta*).	• Tree and shrub cover <25% with variable flooding regimes (water depth <2m) (MA). • Water up to 2 m deep (MAS). • Mineral soil (2).
MAM	Meadow Marsh		
MAM	Meadow Marsh	**Ground Cover:** includes Canada goldenrod, purple loosestrife (*Lythrum salicara*), reed-canary grass (*Phalaris arundinacea*), coltsfoot, Canada thistle, and cattails.	• Tree and shrub cover <25% with variable flooding regimes (water depth <2m) (MA). • Species less tolerant of prolonged flooding (M).
OAO	Open Aquatic		
OAO	Open Aquatic		• Water depth >2 m (O). • No macrophyte vegetation, no tree or shrub cover (A). • Plankton dominated (O).
OTHER**	Manicured and Hedgerow		
M and H	Manicured grasses and planted shrubs and/or trees	Areas where large expanses of grass/shrubs/trees are maintained and/or planted.	

* Not identified as an ELC community by Lee, H., W. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig, and S. McMurray. 1998. *Ecological Land Classification for Southern Ontario: First Approximation and Its Application*. Natural Heritage Information Centre.

The natural/semi-natural features within the study area consist of wetland and forest communities. The wetland communities within the study area are generally associated with the riparian areas of the watercourses with the exception of a large shallow marsh community (MAS2) located located east of the study area on the west side of Pine Valley Drive. This shallow marsh community is identified as Provincially Significant Wetland and supports a large diversity of native plant species. The wetlands are considered to be moderate quality shallow marsh and meadow marsh communities. A large deciduous forest community is located on the south side of Teston Road and is associated with Purpleville Creek. This community is part of a larger forest community that extends beyond the study area and is considered to be of moderate to higher quality. A mixed forest community was identified on the north side of Teston Road and is considered to be of moderate quality. In general, the forest communities within the study area support a higher proportion of native plant species.

The cultural vegetation communities within the study area contained a high proportion of non-native plant species that are well adapted to persist in areas that are regularly disturbed including species that are adapted to high light conditions, limited soil moisture and species that are tolerant of salt spray. The cultural vegetation communities within the study area are considered to be low quality.

There are several areas that are not identified as ELC vegetation communities including manicured areas (M) which include mown lawns, gardens and planted trees, and hedgerows (H) which includes trees that have been planted or that have been maintained for the purposes of preserving windbreaks between agricultural fields and screens between residential units and local roadways. The limits of the manicured areas and hedgerows are presented on **Figure 3a and b.**

3.3.3.2 Flora

A total of 143 plant species have been recorded within the study area. One of these plants could only be identified to genus and are not included in the following calculations. Of the 142 plant species identified, 80 (56%) plant species identified are native to Ontario and 62 (44%) 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**.

3.3.4 Species at Risk

No plant species that are regulated under the Ontario *Endangered Species Act* (ESA) or the Canada *Species at Risk Act* (SARA) were encountered during LGL's botanical investigation within the study area (those plant species regulated as Endangered, Threatened, or Special Concern). A description of provincial species ranks is provided in **Appendix C**.

A review of the MNRF Natural Heritage Information Centre (2020) identified records of butternut (*Juglans cinerea*) within the vicinity of the study area. Butternut is regulated as Endangered under the ESA. No butternut individuals were identified during LGL's botanical field investigation.

Regionally/Locally Rare Plant Species

Two plant species that are rare in York Region and three plant species that are TRCA species of concern (L1 to L3) were identified within the study area. **Table 4** presents the list of rare species, the applicable S Rank, local species rank and which vegetation community each species was identified within. A description of species rank definitions is presented in **Appendix C**.

TABLE 4.
SUMMARY OF REGIONALLY RARE PLANT SPECIES IDENTIFIED WITHIN THE STUDY AREA

Scientific Name	Common Name	SRank	York	TRCA	FOM	FOD7-3	FOD8	CUP3	CUP3-3	CUW1
Picea glauca	white spruce	S5		L3	x	x		X	x	x
Ribes hirtellum	smooth gooseberry	S5		L3	x		x			
Pinus resinosa	red pine	S5	R4	L1				x	x	
Juglans nigra	black walnut	S4	R1 Nat		x	x				

3.4 Wildlife and Wildlife Habitat

3.4.1 Purpose

A secondary source investigation and field surveys were carried out to characterize wildlife and wildlife habitat within the study area.

3.4.2 Data Sources

Information regarding wildlife and wildlife habitat within the study area was obtained from the following sources:

- The Natural Heritage Information Centre data available through *Make a Map* (MNRF 2020);
- Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature. Editors: Michael D. Cadman, Donald A. Sutherland, Gregor G. Beck, Denis Lepage, and Andrew R. Couturier. Ontario Breeding Bird Atlas. 2001 – 2005;
- Couturier, A. 1999. Conservation Priorities for the Birds of Southern Ontario. Bird Studies Canada;
- Ministry of Natural Resources and Forestry (MNRF). 2000. *Significant Wildlife Habitat Technical Guide*. Fish and Wildlife Branch – Wildlife Section; and,
- Dobbyn, J.S. 1994. *Atlas of the Mammals of Ontario*. Federation of Ontario Naturalists. Toronto.

Field investigations were conducted to document wildlife and wildlife habitat and to characterize the nature, extent and significance of wildlife usage within the study area between April and July of 2020. Wildlife investigations were focused within and adjacent to the Teston Road right-of-way, from west of Kipling Avenue to Pine Valley Drive. Direct observations, calls and tracks were used to record wildlife present within the study area. A summary of survey date(s), tasks, weather and personnel for each visit is presented in **Table 5**. The methodology and results of these surveys are described in the following sections.

TABLE 5.
SUMMARY OF DATE OF INVENTORY, TASK, WEATHER AND PERSONNEL

Date of Inventory	Task	Weather	LGL Personnel
April 8, 2020	Anuran survey	12^0C, partially cloudy, 13 km/hr wind	Dana Couture, Anna Jose
May 15, 2020	Anuran survey	14^0C, partially cloudy, 10 km/hr wind	Dana Couture, Anna Jose
June 9, 2020	Anuran survey	26^0C, clear, 11 km/hr wind	Dana Couture, Anna Jose
June 4, 2020	Breeding Bird survey and incidental wildlife survey	13.4-21.6°C, 0-5km/hr wind, few clouds, no precipitation	Derek Morningstar
June 12, 2020	Breeding Bird survey and incidental wildlife survey	9.3-24.2°C, 0-5km/hr wind, clear sky, no precipitation	Derek Morningstar

3.4.2.1 Anuran Survey

Methodologies outlined in the Marsh Monitoring Program Protocol (2000) were applied to confirm presence/absence of anuran species (frogs and toads), document potential breeding habitat/areas, and confirm the nature, extent and significance of amphibian usage. Stations were strategically placed where amphibian breeding habitat was suspected, based on air-photo interpretation and a review of the study area (see **Figures 3a and b**). Although amphibians do not frequently breed within flowing water where fish predators may exist, these areas were still surveyed in case there are overflow pools and wetlands in riparian habitat where amphibians breed. Field investigations within the study area were conducted on three separate nights during the spring and summer of 2020, ran from one half hour after sunset and ended prior to midnight and were conducted during appropriate weather conditions (see **Table 5**). Investigations were undertaken during periods of peak anuran breeding activity and vocalization.

3.4.2.2 Breeding Bird Survey

Breeding bird surveys were conducted on two dates during the 2020 breeding bird season to document breeding bird evidence (BBE) and to characterize the nature, extent and significance of breeding bird usage of the habitats within the Study Area (see **Table 5**). In all habitat types, survey methodology and breeding bird behaviours used as evidence of breeding success were categorized according to the Ontario Breeding Bird Atlas (Cadman et al., 2007). Locations of the eight breeding bird point count stations are shown in **Figures 3a and b**.

3.4.3 Findings

3.4.3.1 Wildlife Habitat

The Study Area falls within a mostly rural area with very few houses adjacent to the road, but the road frequently has high traffic volume of motorists passing through. All wildlife surveys were completed from the Teston Road right-of-way, and therefore may under-represent species that are typically found further away from roads.

Northeast of the junction of Teston Road and Kleinburg Summit Way is an area of land that has been re-naturalized with wetlands, grasses, trees and shrubs. Although the trees are still young, herbaceous vegetation has been successfully established and now provides wildlife habitat already being used by various species that are quick to inhabit new areas like Red-winged Blackbirds (*Agelaius phoeniceus*), Green Frog (*Lithobates calamitans*) and muskrat (*Ondatra zibethicus*). A natural area of forest and wetland is also present northwest of Teston and Pine Valley Drive, used by many wildlife species. Tributaries of the East Humber River and Purpleville Creek cross Teston Road at four locations, where riparian habitat is provided for wildlife and a potential movement corridor. Between these areas, north of Teston Road is predominantly agricultural land, but some of the hay and pasture fields provide grassland habitat.

South of Teston Road there are forested areas west of Kipling Avenue and central between Kipling and Pine Valley Drive where wildlife can seek refuge, breeding habitat and movement across the landscape. The area southwest of Teston Road at Pine Valley Drive is currently under development as a residential area, but was open mud with very little vegetation or habitat at the time of investigation. While the construction area provides little habitat for wildlife, tracks are easily visible and some species such as Killdeer (*Charadrius vociferus*) will readily use the mudflats for nesting and other shorebirds will stop at these types of areas while on migration.

Bindertwine Park and Glassco Park are south of Teston Road, within which there is extensive natural areas that host a broad diversity of wildlife. Natural areas such as these are likely the source of many existing wildlife and SAR records for the area. These parks were not surveyed for this project because the habitat is unlikely to be disturbed directly for this project.

The Study Area falls within the southern boundary of Ecoregion 6E-7: Mixedwood Plains, Lake Simcoe-Rideau. The Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E describe 38 habitat types that are considered significant within four categories. There is no habitat which meets the criteria or Rare Vegetation Communities or Animal Movement Corridors, although the East Humber River may function as a movement corridor. Seasonal Concentration Areas of Animals include 16

types, of which there is the potential for candidate Raptor Wintering Area and Bat Maternity Colonies. Specialized Habitat for Wildlife includes eight types, of which there are no candidate habitat identified within the Study Area. The wetland at the northwest corner of Teston Road and Pine Valley Drive (Frog Station 5) meets the criteria for Significant Amphibian Breeding Habitat (Woodland), but is outside of the Study Area. There are five categories of Habitat for Species of Conservation Concern, of which there are none identified within thie Study Area. Although there are some indicator bird species for Open Country and Shrub/Early Successional Bird Breeding Habitats, the fields are regularly disturbed by agricultural activities and the remnant areas are not large enough to be considered candidate SWH.

Candidate Raptor Wintering Area is a combination of fields and woodlands that comprise at least 30 ha. Several of the fields north of Teston Road would be suitable for winter use by raptors and are located adjacent to woodlands of various types and sizes. The riparian habitat associated with the East Humber River also contributes to this habitat. An evaluation of significant wildlife habitat based on winter raptor surveys was not completed.

Bat Maternity Colonies may exist within the woodlands that are adjacent to Teston Road and within the Study Area, even if the bat roosts themselves are not at the road where they may be disturbed by the development. Survey access was only available for the roadside, so it was not possible to determine the overall habitat quality for bat maternity roosting and no targeted bat surveys were completed.

3.4.3.2 Fauna

Based on field observations and secondary source data from TRCA, 62 species of wildlife could be verified in the study area and the majority of these records came from identification (through calls and sightings) of bird species with more modest numbers of herpetofauna and mammal species identified. This includes 48 birds, 7 mammals, 6 amphibians and 1 reptile, discussed in more detail below. The wildlife assemblage is for the most part typical of rural settings and includes wildlife species that are tolerant of human activity and habitat disturbance.

Of the 48 bird species recorded, 39 are protected under the *Migratory Birds Convention Act* (MBCA) and two bird species are protected under the *Fish and Wildlife Conservation Act* (FWCA). Seven bird species are not afforded any legislative protection. All seven of the recorded mammal species are afforded protection under the FWCA and one of the amphibians is protected under the FWCA. All wildlife observed in the Study Area are presented in **Table 6**.

TABLE 6.
WILDLIFE SPECIES DOCUMENTED IN THE STUDY AREA

Wildlife	Scientific Name	Common Name	Observation	SARA	ESA	Legal Status	Other
Herpetofauna	*Bufo americanus*	American Toad	Field				
	Hyla versicolor	Gray Treefrog	Field			FWCA (P)	
	Pseudacris maculata	Western Chorus Frog (Great Lakes / St. Lawrence - Canadian Shield Pop'n)	TRCA	THR			
	Pseudacris crucifer	Spring Peeper	Field				
	Lithobates clamitans	Green Frog	Field				
	Lithobates sylvatica	Wood Frog	TRCA				
	Chrysemys picta marginata	Midland Painted Turtle	Field				
Birds	*Branta canadensis*	Canada Goose	Field			MBCA	
	Anas platyrhynchos	Mallard	Field			MBCA	
	Meleagris gallopava	Wild Turkey	Field			FWCA	
	Ardea herodias	Great Blue Heron	Field			MBCA	
	Charadrius vociferus	Killdeer	Field			MBCA	
	Larus delawarensis	Ring-billed Gull	Field			MBCA	
	Columba livia	Rock Pigeon	Field				
	Zenaida macroura	Mourning Dove	Field			MBCA	
	Colaptes auratus	Northern Flicker	Field			MBCA	
	Dryocopus pileatus	Pileated Woodpecker	Field			MBCA	SWH
	Empidonax traillii	Willow Flycatcher	Field			MBCA	
	Sayornis phoebe	Eastern Phoebe	Field			MBCA	
	Myiarchus crinitus	Great Crested Flycatcher	Field			MBCA	
	Tyrannus tyrannus	Eastern Kingbird	Field			MBCA	
	Vireo olivaceus	Red-eyed Vireo	Field			MBCA	
	Cyanocitta cristata	Blue Jay	Field			FWCA	
	Corvus brachyrhynchos	American Crow	Field				
	Eremophila alpestris	Horned Lark	Field			MBCA	
	Tachycineta bicolor	Tree Swallow	Field			MBCA	

TABLE 6.
WILDLIFE SPECIES DOCUMENTED IN THE STUDY AREA

Wildlife	Scientific Name	Common Name	Observation	SARA	ESA	Legal Status	Other
	Hirundo rustica	Barn Swallow	Field	THR	THR	MBCA	
Birds (continued)	*Poecile atricapilla*	Black-capped Chickadee	Field			MBCA	
	Troglodytes aedon	House Wren	Field			MBCA	
	Turdus migratorius	American Robin	Field			MBCA	
	Dumetella carolinensis	Gray Catbird	Field			MBCA	
	Sturnus vulgaris	European Starling	Field				
	Bombycilla cedrorum	Cedar Waxwing	Field			MBCA	
	Vermivora pinus	Blue-winged Warbler	TRCA			MBCA	
	Oreothlypis ruficapilla	Nashville Warbler	Field			MBCA	
	Setophaga petechia	Yellow Warbler	Field			MBCA	
	Setophaga magnolia	Magnolia Warbler	Field			MBCA	SWH
	Setophaga ruticilla	American Redstart	Field			MBCA	SWH
	Geothlypis philadelphia	Mourning Warbler	Field			MBCA	
	Geothlypis trichas	Common Yellowthroat	Field			MBCA	
	Spizella passerina	Chipping Sparrow	Field			MBCA	
	Spizella pusilla	Field Sparrow	TRCA			MBCA	
	Pooecetes gramineus	Vesper Sparrow	Field			MBCA	
	Passerculus sandwichensis	Savannah Sparrow	Field			MBCA	SWH
	Melospiza melodia	Song Sparrow	Field			MBCA	
	Zonotrichia albicollis	White-throated Sparrow	Field			MBCA	
	Cardinalis cardinalis	Northern Cardinal	Field			MBCA	
	Pheucticus ludovicianus	Rose-breasted Grosbeak	Field			MBCA	
	Dolichonyx oryzivorus	Bobolink	TRCA and Field	THR	THR	MBCA	
	Agelaius phoeniceus	Red-winged Blackbird	Field				
	Sturnella magna	Eastern Meadowlark	TRCA and Field	THR	THR	MBCA	
	Quiscalus quiscula	Common Grackle	Field				
	Molothrus ater	Brown-headed Cowbird	Field				
	Spinus tristis	American Goldfinch	Field			MBCA	

TABLE 6.
WILDLIFE SPECIES DOCUMENTED IN THE STUDY AREA

Wildlife	Scientific Name	Common Name	Observation	SARA	ESA	Legal Status	Other
	Passer domesticus	House Sparrow	Field				
Mammals	*Sylvilagus floridanus*	Eastern Cottontail	Field			FWCA(G)	
	Tamias striatus	Eastern Chipmunk	Field			FWCA(P)	
	Sciurus carolinensis	Grey Squirrel	Field			FWCA(G)	
	Canis latrans	Coyote	Field			FWCA(F)	
	Procyon lotor	Northern Raccoon	Field			FWCA(F)	
	Mephitis mephitis	Striped Skunk	Field			FWCA(F)	
	Odocoileus virginianus	White-tailed Deer	Field			FWCA(G)	

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 - E*ndangered Species Act*
SARA - *Species at Risk Act*
FWCA - *Fish and Wildlife Conservation Act*
(P) Protected Species (G) Game species (F) Furbearing mammals

Herpetofauna Species

Anuran breeding evidence was documented for four species during 2020 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. A summary of anuran species and their respective call level codes is presented in **Table 7**. In addition to these species documented during the anuran breeding surveys, Western Chorus Frog (*Pseudacris maculata*) and the Wood Frog (*Lithobates sylvatica*) were also previously recorded by the TRCA. Midland Painted Turtle was also observed within the Study Area on other surveys.

TABLE 7.
AMPHIBIAN SURVEY OF STUDY AREA

Station	Scientific Name	Common Name	SARA	ESA	Local	Legal Status	Call Level Code
1	*Hyla versicolor*	Gray Treefrog				FWCA(P)	2
	Rana clamitans	Green Frog					1
*2**	-	-					
*3**	-	-					
*4**	-	-					
5	*Bufo americanus*	American Toad					1
	Hyla versicolor	Gray Treefrog				FWCA(P)	3
	Pseudacris crucifer	Spring Peeper					3

Breeding Birds

The study area contained a moderate number of breeding bird species representing several habitat types. A summary of the bird species, species ranks, breeding evidence, and station locations are presented in **Table 8**.

TABLE 8.
BREEDING BIRD SPECIES DOCUMENTED IN THE STUDY AREA

COMMON NAME	*SCIENTIFIC NAME*	ESA	SARA	TRCA records	BBS-01	BBS-02	BBS-03	BBS-04	BBS-05	BBS-06	BBS-07	BBS-08	Max BBE
Canada Goose	*Branta canadensis*						OBS			OBS	OBS		OBS
Mallard	*Anas platyrhynchos*					OBS	OBS		OBS	POSS-S			POSS
Wild Turkey	*Meleagris gallopava*												OBS
Great Blue Heron	*Ardea herodias*				OBS	OBS			OBS			OBS	OBS
Killdeer	*Charadrius vociferus*											POSS-S	POSS
Ring-billed Gull	*Larus delawarensis*				OBS				OBS	OBS			OBS
Rock Pigeon	*Columba livia*												OBS
Mourning Dove	*Zenaida macroura*									POSS-S		POSS-H	POSS
Northern Flicker	*Colaptes auratus*					POSS-H		POSS-H					POSS
Pileated Woodpecker	*Dryocopus pileatus*								PROB-P				PROB
Willow Flycatcher	*Empidonax traillii*						PROB-T						PROB
Eastern Phoebe	*Sayornis phoebe*												OBS
Great Crested Flycatcher	*Myiarchus crinitus*							POSS-H					POSS
Eastern Kingbird	*Tyrannus tyrannus*				POSS-H	PROB-T		POSS-S	POSS-H				PROB
Red-eyed Vireo	*Vireo olivaceus*				POSS-H		POSS-H		POSS-H			POSS-S	POSS
Blue Jay	*Cyanocitta cristata*				POSS-H	PROB-T	POSS-H	PROB-T	POSS-S			POSS-H	PROB
American Crow	*Corvus brachyrhynchos*					PROB-T	OBS	OBS	PROB-T	POSS-S	POSS-S	OBS	PROB
Horned Lark	*Eremophila alpestris*								POSS-H	POSS-H			POSS
Tree Swallow	*Tachycineta bicolor*											POSS-H	POSS
Barn Swallow	*Hirundo rustica*	THR	THR										OBS
Black-capped Chickadee	*Poecile atricapilla*				POSS-H	PROB-T	PROB-T	PROB-T	POSS-H		POSS-H	POSS-H	PROB
House Wren	*Troglodytes aedon*					POSS-H		POSS-H					POSS
American Robin	*Turdus migratorius*				PROB-P	PROB-T	PROB-T	POSS-H	POSS-S	POSS-S	POSS-H	PROB-T	PROB
Gray Catbird	*Dumetella carolinensis*						POSS-S						POSS
European Starling	*Sturnus vulgaris*				PROB-T	POSS-S		PROB-T	PROB-T	PROB-T	POSS-S	POSS-S	PROB
Cedar Waxwing	*Bombycilla cedrorum*				POSS-S	PROB-M	POSS-S		PROB-M	POSS-S			PROB
Blue-winged Warbler	*Vermivora pinus*			x									
Nashville Warbler	*Oreothlypis ruficapilla*				POSS-H		POSS-H		POSS-S				POSS
Yellow Warbler	*Setophaga petechia*					POSS-H	POSS-H			POSS-H			POSS
Magnolia Warbler	*Setophaga magnolia*					POSS-H							POSS
American Redstart	*Setophaga ruticilla*						POSS-H						POSS
Mourning Warbler	*Geothlypis philadelphia*							POSS-H					POSS
Common Yellowthroat	*Geothlypis trichas*					PROB-T	POSS-H	PROB-T	PROB-T	POSS-H	PROB-T		PROB
Chipping Sparrow	*Spizella passerina*				PROB-T	POSS-H		POSS-S	POSS-H		PROB-T	PROB-T	PROB
Field Sparrow	*Spizella pusilla*			x									
Vesper Sparrow	*Pooecetes gramineus*												OBS
Savannah Sparrow	*Passerculus sandwichensis*										PROB-T		PROB
Song Sparrow	*Melospiza melodia*				PROB-T	PROB-T	PROB-T	PROB-T	PROB-T	POSS-S	PROB-T	POSS-H	PROB
White-throated Sparrow	*Zonotrichia albicollis*							POSS-H					POSS
Northern Cardinal	*Cardinalis cardinalis*				PROB-T		POSS-S	POSS-H	POSS-H		PROB-T		PROB
Rose-breasted Grosbeak	*Pheucticus ludovicianus*							POSS-H					POSS
Bobolink	*Dolichonyx oryzivorus*	THR	THR	x						POSS-H	POSS-H		POSS
Red-winged Blackbird	*Agelaius phoeniceus*				POSS-H	PROB-P	PROB-P	PROB-T		CONF-NM	PROB-T	PROB-T	CONF
Eastern Meadowlark	*Sturnella magna*	THR	THR	x							POSS-H		POSS
Common Grackle	*Quiscalus quiscula*				POSS-H				POSS-S	POSS-S		POSS-S	POSS

TABLE 8.
BREEDING BIRD SPECIES DOCUMENTED IN THE STUDY AREA

COMMON NAME	*SCIENTIFIC NAME*	ESA	SARA	TRCA records	BBS-01	BBS-02	BBS-03	BBS-04	BBS-05	BBS-06	BBS-07	BBS-08	Max BBE
Brown-headed Cowbird	*Molothrus ater*				POSS-H	PROB-T		POSS-S	POSS-H				PROB
American Goldfinch	*Spinus tristis*				PROB-T	PROB-T	PROB-T	PROB-P	PROB-T	PROB-T	PROB-T		PROB
House Sparrow	*Passer domesticus*					POSS-H	PROB-P		POSS-S	POSS-S			PROB

[1]For definitions of species ranks, refer to **Appendix D**.

[2]BBE - Breeding Bird Evidence (according to Bird Studies Canada):
Observed (OBS): Species observed, no breeding evidence
Possible Breeding (POSS): 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 (PROB):
M – At least 7 individuals
P – Pair observed
T - Permanent territory presumed through registration of territorial song on at least two days, a week or so apart, at the same place.
C – Courtship display
V – Visiting probable nest site
A - Agitated behaviour or anxiety calls of an adult
B – Brood patch on female or cloacal proturbance on male
Confirmed Breeding (CONF):
NB – Nest building, except by wren or woodpecker
DD – Distraction display
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.
AE – Adult exiting nest site
CF - Adult carrying food for young.
NE - Nest containing eggs.
NY - Nest with young seen or heard.
[3]Breeding Bird Point Count Station.

Forty-six bird species were observed during the Breeding Bird Surveys, with varying evidence of breeding success across the study area. Of these 46 species, breeding evidence was confirmed in one, probable for seventeen species, possible for twenty species and three species were observed with no indication of breeding (see **Table 8**). Confirmed breeding by bird species was documented based on used nests, including species such as the Red-winged Blackbird (*Agelaius phoeniceus*). The species most frequently recorded were the American Robin (*Turdus migratorius*) and Song Sparrow (*Melospiza melodia*), both of which were recorded at all eight monitoring stations. Four species were recorded at seven of the eight stations: American Crow (*Corvus brachyrhynchos*), Black-capped Chickadee (*Poecile atricapilla*), Red-winged Blackbird (*Agelaius phoeniceus*) and American Goldfinch (*Spinus tristis*).

Data provided by TRCA identified four species previously identified in/near the study area including Bobolink (*Dolichonyx oryzivorus*), Eastern Meadowlark (*Sturnella magna*), Blue-winged Warbler (*Vermivora pinus*) and Field Sparrow (*Spizella pusilla*).

Of all bird species documented, three are SAR: Bobolink, Eastern Meadowlark and Barn Swallow (*Hirundo rustica*).

Mammal Species

Documentation of mammals were made through visual observation of the animals themselves or tracks and signs of the animals while conducting targeted surveys for other taxanomic groups (i.e. bird surveys). Through these observations seven species of mammals were observed. A bat was also observed flying over the pond at the frog monitoring station 4, but the species could not be identified because no recording device was used at the time. The mammal species or signs observed include the following:

- Eastern Cottontail (*Sylvilagus floridanus*);
- Eastern Chipmunk (*Tamias striatus*);
- Grey Squirrel (*Sciurus carolinensis*);
- Coyote (*Canis latrans*);
- Northern Raccoon (*Procyon lotor*);
- Striped Skunk (*Mephitis mephitis*); and,
- White-tailed Deer (*Odocoileus virginianus*).

The study area is located within a rural and agricultural area with residential area nearby where there are houses and other buildings of many different types and ages. Bats, particularly the Big Brown Bat and Little Brown Myotis are well-adapted to gain

access into constructed buildings and use them as maternity roosts. Similarly, these species as well as many other bat species will use trees for roosting. The existing shoulder on this road is very narrow, so there are many trees that are close to or over-hang the road. If any buildings or large trees must be removed for the project, they should be investigated further for the presence of bats.

The Study Area has many remnant natural areas that are suitable for wildlife movement, particularly along the East Humber River tributaries. The mammal species documented represent an assemblage that readily utilizes human influenced landscapes.

Secondary source data from TRCA did not include any mammals for the study area.

3.4.4 Species at Risk

LGL conducted a desktop-based review of species at risk (SAR), followed by a field survey to determine if suitable habitat exists for each species. The databases were reviewed to determine these constraints include the following:

- Natural Heritage Information Centre (NHIC);
- Bat Conservation International Species Profiles;
- Atlas of the Breeding Birds of Ontario (OBBA);
- eBird;
- iNaturalist;
- Rare Vascular Plants of Ontario (Oldham and Brinker 2009);
- Vascular Plants at Risk in Ontario (Leslie 2018)
- Butterfly Atlas of Ontario; and,
- Bumblebee Watch.

SAR identified in the desktop search and those identified in the field in 2020 listed in **Table 9**. Those observed in the field are discussed in the sections below along with a description of the habitat.

Through the SAR screening 24 species were identified, of which 18 are listed as endangered or threatened under the Ontario *Endangered Species Act, 2007* (ESA). Of these, nine species have moderate or high potential or were confirmed to occur in the Study Area.

TABLE 9.
SPECIES AT RISK DOCUMENTED IN SECONDARY SOURCES OR IN THE FIELD IN 2020

Common Name	Scientific Name	Species at Risk Act (Sch 1)	Endangered Species Act	Habitat Requirements	Potential to Occur	Rationale for Potential to Occur
Monarch	*Danaus plexippus*	SC	SC	In Ontario, monarch is found throughout the northern and southern regions of the province. This butterfly is found wherever there are milkweed (Asclepius spp.) plants for its caterpillars and wildflowers that supply a nectar source for adults. It is often found on abandoned farmland, meadows, open wetlands, prairies and roadsides, but also in city gardens and parks. Important staging areas during migration occur along the north shores of the Great Lakes (COSEWIC 2010).	Moderate	Several fields on the site, which have meadow boundaries that have some milkweed.
Rapids clubtail	*Gomphus quadricolor*	END	END	In Ontario, rapids clubtail has been recorded in only four rivers in southwestern and southeastern Ontario: Thames, Humber, Credit and Mississippi. This dragonfly's nymph inhabits medium to large, swift-flowing streams with interspersed rapids and muddy pools. Gravel or cobble substrate is preferred, and protruding boulders are used by adults to perch. Riparian forest habitat is also required for adult females (Hamill 2010).	High	Local NHIC record from 2015, may use East Humber River Tributaries within Study Area.
Rusty-patched bumble bee	*Bombus affinis*	END	END	In Ontario, rusty-patched bumble bee is found in areas from the southern Great Lakes – St. Lawrence forest region southwards into the Carolinian forest. It is a habitat generalist, but it is typically found in open habitats, such as mixed farmland, savannah, marshes, sand dunes, urban and lightly wooded areas. It is cold –tolerant and can be found at high elevations. Most recent sightings in Ontario have been in oak savannah habitat with well-drained, sandy soils and moderately open canopy. It	Moderate	NHIC record from 1993, but no record on BumbleBee Watch. Could use a variety of habitats in the Study Area.

TABLE 9.
SPECIES AT RISK DOCUMENTED IN SECONDARY SOURCES OR IN THE FIELD IN 2020

Common Name	Scientific Name	Species at Risk Act (Sch 1)	Endangered Species Act	Habitat Requirements	Potential to Occur	Rationale for Potential to Occur
				requires an abundance of flowering plants for forage. This species most often builds nests underground in old rodent burrows, but also in hollow tree stumps and fallen dead wood (Colla and Taylor-Pindar 2011). The only recent sightings in Ontario are from the Pinery Provincial Park.		
Bank swallow	*Riparia riparia*	THR	THR	In Ontario, the bank swallow breeds in a variety of natural and anthropogenic habitats, including lake bluffs, stream and river banks, sand and gravel pits, and roadcuts. Nests are generally built in a vertical or near-vertical bank. Breeding sites are typically located near open foraging sites such as rivers, lakes, grasslands, agricultural fields, wetlands and riparian woods. Forested areas are generally avoided (Garrison 1999).	Low	Although there are banks along the East Humber River, studies within the Study Area did not identify this species or nesting adjacent to the road.
Barn swallow	*Hirundo rustica*	THR	THR	In Ontario, barn swallow breeds in areas that contain a suitable nesting structure, open areas for foraging, and a body of water. This species nests in human made structures including barns, buildings, sheds, bridges, and culverts. Preferred foraging habitat includes grassy fields, pastures, agricultural cropland, lake and river shorelines, cleared right-of-ways, and wetlands (COSEWIC 2011). Mud nests are fastened to vertical walls or built on a ledge underneath an overhang. Suitable nests from previous years are reused (Brown and Brown 1999).	Confirmed	This species was observed within the horse pastures at the east end of the Study Area, north of Teston Road. The birds were flying into and out of the horse shelters which may be used for nesting.

TABLE 9.
SPECIES AT RISK DOCUMENTED IN SECONDARY SOURCES OR IN THE FIELD IN 2020

Common Name	Scientific Name	Species at Risk Act (Sch 1)	Endangered Species Act	Habitat Requirements	Potential to Occur	Rationale for Potential to Occur
Bobolink	*Dolichonyx oryzivorus*	THR	THR	In Ontario, bobolink breeds in grasslands or graminoid dominated hayfields with tall vegetation (Gabhauer 2007). Bobolink prefers grassland habitat with a forb component and a moderate litter layer. They have low tolerance for presence of woody vegetation and are sensitive to frequent mowing within the breeding season. They are most abundant in established, but regularly maintained, hayfields, but also breed in lightly grazed pastures, old or fallow fields, cultural meadows and newly planted hayfields. Their nest is woven from grasses and forbs. It is built on the ground, in dense vegetation, usually under the cover of one or more forbs (Martin and Gavin 1995).	Confirmed	This species was identified at the east end of the project, north of Teston Road in the hay fields.
Canada warbler	*Cardellina canadensis*	THR	SC	In Ontario, breeding habitat for Canada warbler consists of moist mixed forests with a well-developed shrubby understory. This includes low-lying areas such as cedar and alder swamps, and riparian thickets (McLaren 2007). It is also found in densely vegetated regenerating forest openings. Suitable habitat often contains a developed moss layer and an uneven forest floor. Nests are well concealed on or near the ground in dense shrub or fern cover, often in stumps, fallen logs, overhanging stream banks or mossy hummocks (Reitsma et al. 2010).	Low	There is suitable habitat located within the natural areas south of Teston Road and along the East Humber River Tributaries, but this species was not detected during Breeding Bird Surveys from the road.

TABLE 9.
SPECIES AT RISK DOCUMENTED IN SECONDARY SOURCES OR IN THE FIELD IN 2020

Common Name	Scientific Name	Species at Risk Act (Sch 1)	Endangered Species Act	Habitat Requirements	Potential to Occur	Rationale for Potential to Occur
Chimney swift	*Chaetura pelagica*	THR	THR	In Ontario, chimney swift breeding habitat is varied and includes urban, suburban, rural and wooded sites. They are most commonly associated with towns and cities with large concentrations of chimneys. Preferred nesting sites are dark, sheltered spots with a vertical surface to which the bird can grip. Unused chimneys are the primary nesting and roosting structure, but other anthropogenic structures and large diameter cavity trees are also used (COSEWIC 2007).	Low	The buildings within the Study Area may have suitable chimneys, but they are set back from the road. The species was not identified during Breeding Bird Surveys from the road.
Eastern meadowlark	*Sturnella magna*	THR	THR	In Ontario, the eastern meadowlark breeds in pastures, hayfields, meadows and old fields. Eastern meadowlark prefers moderately tall grasslands with abundant litter cover, high grass proportion, and a forb component (Hull 2003). They prefer well drained sites or slopes, and sites with different cover layers (Roseberry and Klimstra 1970).	Confirmed	This species was identified at the east end of the project, north of Teston Road in the hay fields.
Eastern wood-pewee	*Contopus virens*	SC	SC	The eastern wood-pewee inhabits a wide variety of wooded upland and lowland habitats but is most commonoly associated with the mid-canopy of forest clearings, and edge habitat in deciduous and mixed forests. It also occurs in anthropogenic habitats that provide an open forested aspect such as parks and suburban neighborhoods. It prefers intermediate-age mature forest stands with little understory vegetation (COSEWIC 2012).	Low	There is suitable habitat within the Study Area. The species was not identified during Breeding Bird Surveys from the road.

TABLE 9.
SPECIES AT RISK DOCUMENTED IN SECONDARY SOURCES OR IN THE FIELD IN 2020

Common Name	Scientific Name	Species at Risk Act (Sch 1)	Endangered Species Act	Habitat Requirements	Potential to Occur	Rationale for Potential to Occur
Wood thrush	*Hylocichla mustelina*	THR	SC	In Ontario, wood thrush breeds in moist, deciduous hardwood or mixed stands that are often previously disturbed, with a dense deciduous undergrowth and with tall trees for singing perches. This species selects nesting sites with the following characteristics: lower elevations with trees less than 16 m in height, a closed canopy cover (>70 %), a high variety of deciduous tree species, moderate subcanopy and shrub density, shade, fairly open forest floor, moist soil, and decaying leaf litter (COSEWIC 2012).	Low	There is suitable habitat within the Study Area. The species was not identified during Breeding Bird Surveys from the road.
Redside dace	*Clinostomus elongatus*	END	END	In Ontario, the Redside Dace are found in a few tributaries of Lake Huron, in streams flowing into western Lake Ontario, the Holland River (which flows into Lake Simcoe), Irvine Creek of the Grand River system (which flows into Lake Erie) and on St. Joseph's Island in northeastern Ontario.They are found in pools and slow-moving areas of small headwater streams with clear to turbid water. Overhanging grasses, shrubs, and undercut banks, are an important part of their habitat, as are instream boulders and large woody debris. Preferred substrates are variable and include silt, sand, gravel and boulders. Spawning occurs in shallow riffle areas (Redside Dace Recovery Team 2010).	Low	The species is classified as present in the East Humber River, Purpleville Creek and its tributary; however, these watercourses were dry at the time of field investigation. Their intermittent nature likely limits the potential to support Redside Dace within the study area.

TABLE 9.
SPECIES AT RISK DOCUMENTED IN SECONDARY SOURCES OR IN THE FIELD IN 2020

Common Name	Scientific Name	Species at Risk Act (Sch 1)	Endangered Species Act	Habitat Requirements	Potential to Occur	Rationale for Potential to Occur
Eastern small-footed myotis	*Myotis leibii*	—	END	This species is not known to roost within trees, but there is very little known about its roosting habits. The species generally roosts on the ground under rocks, in rock crevices, talus slopes and rock piles. It occasionally inhabits buildings. Areas near the entrances of caves or abandoned mines may be used for hibernaculum, where the conditions are drafty with low humidity, and may be subfreezing (Humphrey 2017).	Low	No suitable rock piles were identified for roosting and no potential hibernacula were identified in the Study Area.
Little brown myotis	*Myotis lucifugus*	END	END	In Ontario, this species range is extensive and covers much of the province. It will roost in both natural and man-made structures. They require a number of large dead trees, in specific stages of decay and that project above the canopy in relatively open areas (Lacki, 2007). May form nursery colonies in the attics of buildings within 1 km of water. Caves or abandoned mines may be used for hibernaculum, but high humidity and stable above freezing temperatures are required.	Moderate	Several houses and other buildings are in the Study Area, but not close to Teston Road. Several trees are close to the road, but none were specifically classified as bat trees in the tree inventory. No potential hibernacula were identified in the Study Area.

TABLE 9.
SPECIES AT RISK DOCUMENTED IN SECONDARY SOURCES OR IN THE FIELD IN 2020

Common Name	Scientific Name	Species at Risk Act (Sch 1)	Endangered Species Act	Habitat Requirements	Potential to Occur	Rationale for Potential to Occur
Tri-colored bat	*Perimyotis subflavus*	END	END	In Ontario, tri-colored bat may roost in foliage, in clumps of old leaves, hanging moss or squirrel nests. They are occasionally found in buildings although there are no records of this in Canada (Poissant et al, 2010). They typically feed over aquatic areas with an affinity to large-bodied water and will likely roost in close proximity to these. Hibernation sites are found deep within caves or mines in areas of relatively warm temperatures. These bats have strong roost fidelity to their winter hibernation sites and may choose the exact same spot in a cave or mine from year to year.	Moderate	Several trees are close to the road, but none were specifically classified as bat trees in the tree inventory. No potential hibernacula were identified in the Study Area.
Northern myotis	*Myotis septentrionalis*	END	END	In Ontario, this species range is extensive and covers much of the province. It will usually roost in hollows, crevices, and under loose bark of mature trees. Roosts may be established in the main trunk or a large branch of either living or dead trees. Caves or abandoned mines may be used for hibernaculum, but high humidity and stable above freezing temperatures are required (COSSARO 2012).	Moderate	Several trees are close to the road, but none were specifically classified as bat trees in the tree inventory. No potential hibernacula were identified in the Study Area.
American ginseng	*Panax quinquefolius*	END	END	In Ontario, American ginseng is found in moist, undisturbed and relatively mature deciduous woods often dominated by sugar maple. It is commonly found on well-drained, south-facing slopes. American ginseng grows under closed canopies in neutral, loamy soils (COSEWIC 2000).	Low	Considered historic in Leslie (2018). Not identified during botanical inventory.

TABLE 9.
SPECIES AT RISK DOCUMENTED IN SECONDARY SOURCES OR IN THE FIELD IN 2020

Common Name	Scientific Name	Species at Risk Act (Sch 1)	Endangered Species Act	Habitat Requirements	Potential to Occur	Rationale for Potential to Occur
Broad beech fern	*Phegopteris hexagonoptera*	—	SC	In Ontario, broad beech fern inhabits rich, undisturbed mature deciduous forest dominated by beech and maple. It typically grows in moist to wet, sandy soils of lower valley slopes and occasionally swamps (van Overbeeke et al. 2013).	Low	Considered historic in Leslie (2018). Not identified during botanical inventory.
Butternut	*Juglans cinerea*	END	END	In Ontario, butternut is found along stream banks, on wooded valley slopes, and in deciduous and mixed forests. It is commonly associated with beech, maple, oak and hickory (Voss and Reznicek 2012). Butternut prefers moist, fertile, well-drained soils, but can also be found in rocky limestone soils. This species is shade intolerant (Farrar 1995).	Low	Not identified during botanical inventory.
Common hoptree	*Ptelea trifoliata*	SC	SC	In Ontario, common hoptree grows in open woodlands, thickets, dry prairies and along dry, and rocky shorelines. It typically occurs in sunny areas with dry sandy or rocky soils (Farrar 1995).	Low	Not identified during botanical inventory.
Dense blazing star	*Liatris spicata*	THR	THR	In Ontario, dense blazing star is found mainly in moist tall-grass prairies, oak savannahs, wet meadows and along roadsides in full sun in open areas (COSEWIC 2010). It grows in moist to wet, sandy calcareous soils (WDNR 2013). It is primarily restricted to southwestern Ontario.	Low	Not identified during botanical inventory.

TABLE 9.
SPECIES AT RISK DOCUMENTED IN SECONDARY SOURCES OR IN THE FIELD IN 2020

Common Name	Scientific Name	Species at Risk Act (Sch 1)	Endangered Species Act	Habitat Requirements	Potential to Occur	Rationale for Potential to Occur
Eastern prairie fringed-orchid	*Platanthera leucophaea*	END	END	In Ontario, eastern prairie fringed-orchid grows in wet prairies, fens, bogs, wet meadows, and wet successional fields. It grows in full sun in neutral to mildly calcareous substrates, and occasionally grows along roadsides or lake margins (Eastern Prairie Fringed-orchid Recovery Team 2010). This species is found only in southern Ontario, and only two locations are currently known on sand spits along the shore of Lake Erie.	Low	Not identified during botanical inventory.
Purple twayblade	*Liparis liliifolia*	THR	THR	In Ontario, purple twayblade occurs in a wide variety of habitats such as open oak woodland and savannah, mixed deciduous forest, shrub thicket, shrub alvar, deciduous swamp, and conifer plantation. This species is commonly found in dry mesic conditions, but there have been reports from wetland habitats (COSEWIC 2010).	Low	Not identified during botanical inventory.
Red mulberry	*Morus rubra*	END	END	In Ontario, red mulberry occurs in moist, well-drained, forested habitats including floodplains, bottomlands, the slopes and ravines along the southern portion of the Niagra escarpment and in swales on some western Lake Erie sand spits. This species is moderately shade tolerant, but grows best in forest openings (Parks Canada Agency 2011). This species is restricted to the Carolinian zone of southwestern Ontario.	Low	Considered historic in Leslie (2018). Not identified during botanical inventory.

Rapids Clubtail (*Gomphus quadricolor*) may occur along the East Humber River where it uses the water in rapids and still-water pools for it's larval stage and then the adults live and breed within these areas, perching on boulders and logs near the water. There is a record on NHIC of this species in the square for this area from June 4, 2015, but the exact location is not known. This species was not specifically surveyed for to determine if it exists in the reaches that cross Teston Road.

Rusty-patch Bumble Bee (*Bombus affinis*) was documented in NHIC in this area in 1993, but there are no records of this species on the more current iNaturalist or Bumble Bee watch and it was not observed in the field, although there were no targeted surveys for this species. Although it was once more widespread, the most recent records of this species are only within the Pinery Provincial Park.

Barn Swallow (*Hirundo rustica*) was observed flying within the horse pasture fields north of Teston Road on the east end of the Study Area, and flying in and out of the horse shelters where they were presumably nesting. Those shelters are set far back from the road and access was not available to inspect them directly. The culverts under Teston Road were inspected for nest of this species, but none were found. Bobolink (*Dolichonyx oryzivorus*) and Eastern Meadowlark (*Sturnella magna*) were identified singing and presumably nesting in the hay fields north of Teston Road on the east end of the Study Area. The exact nest locations were not confirmed because access was not available for this field, but they appeared to be set back from the road. Nest locations and nesting habitat conditions can change annually depending on the agricultural practices in each year. Therefore, another search for grassland bird nesting may be required in advance of disturbance to or near these fields.

Redside Dace (*Clinostomus elongatus*) is discussed further in Section 3.2.4.

Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*) and Tri-colored Bat (*Perimyotis subflavus*) all use trees as maternity roosts, but different parts of the trees. Little Brown Myotis and Northern Myotis will roost within the cavities, caracks and exfoliating bark of large trees of a variety or tree species. Tri-colored Bat roosts within leaf clumps, hanging moss or squirrel nests in the foliage of trees. There are many mature trees within the Study Area within the woodlands or in yards. These will be reviewed closer in the tree inventory, during which signs of suitable roosting habitat will be searched for. Little Brown Myotis will also roost within buildings, but the buildings in the Study Area are set back from the road and unlikely to be disturbed directly. All of these species hibernate underground in mines, caves, crevices and tunnels, but no suitable features of this type were identified in the Study Area.

3.5 Designated Natural Areas

3.5.1 Purpose

Designated natural areas include areas identified for protection by the Ontario Ministry of Natural Resources and Forestry (MNRF), Toronto and Region Conservation Authority, York Region and the City of Vaughan. A review of relevant background data was undertaken to identify designated natural areas within and adjacent to the study. Designated natural areas within the vicinity of the study area are presented in **Figure 4**.

3.5.2 Data Sources

- City of Vaughan. 2010. City of Vaughan Official Plan.
- Ontario Ministry of Natural Resources and Forestry. 2020. Natural Heritage Information Centre. Website available online at: https://www.ontario.ca/environment-and-energy/natural-heritage-information-centre. Accessed June 2017, Ministry of Natural Resources and Forestry. Peterborough, Ontario; and,
- York Region. 2010. Regional Municipality of York Official Plan.

3.5.3 Findings

Areas of Natural and Scientific Interest (ANSIs)

There are no Areas of Natural and Scientific Interest (ANSIs) located in the study area.

Provincially Significant Wetlands (PSWs)

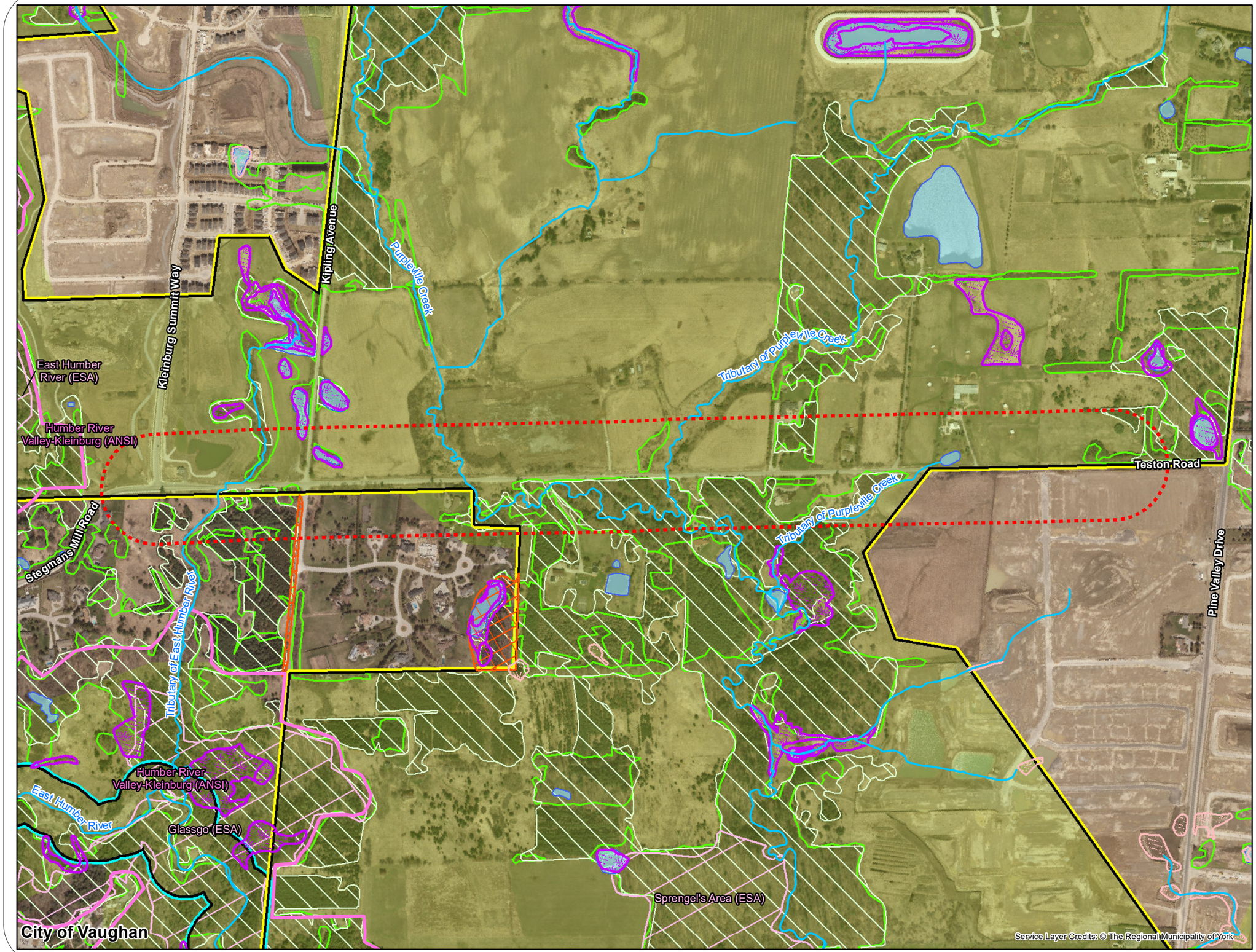
Pockets of the East Humber River Provincially Significant Wetland Complex (PSW) are located within or near the study area. Several small pockets are located north of Teston Road at Kipling Avenue and a large pocket is located east of the study area at Pine Valley Drive. These wetland pockets typically comprise shallow marsh community (MAS2) based on LGL's botanical field investigations. The limits of the PSW found within the study area are presented in **Figure 4**.

Environmentally Sensitive Areas (ESAs)

There are no environmentally sensitive areas (ESAs) located within the study area.

Greenbelt Plan

The entire study area is identified as 'Protected Countryside' under the Greenbelt Plan. The limits of this designation are presented in **Figure 4**.



LEGEND

- Watercourse
- Waterbody
- Study Area
- ANSI, Life Science (Regional Significance)
- Environmentally Significant Area
- Provincially Significant Wetland: East Humber River Wetland Complex
- Wetland Not Evaluated Per OWES
- Woodland Cover (York Region)
- Wooded Area (MNRF)
- Greenland System (York Region)
- Growth Plan for the Greater Golden Horseshoe (NHS Area)

Greenbelt Plan

- Protected Countryside (NHS Area)
- Urban River Valley

Data sources: Ministry of Natural Resources and Forestry, Regional Municipality of York. Contains information licenced under the Open Government Licence - Ontario and York Region Open Data Licence

0 60 120 240 360 m

N

Teston Road
Natural Heritage

LGL LIMITED
environmental research associates

Project:	TA9006	**Figure:**	4
Date:	October, 2020	**Prepared By:**	AJ
Scale:	1:8,000	**Verified By:**	GNK

York Region Official Plan

Based on a review of Map 2 (Regional Greenlands System) of the York Region Official Plan (2010) the entire study area is within the Regional Greenlands System of York Region (**Figure 4**). In addition, based on a review of Map 5 (Woodlands) the forest and woodland communities within the study area are identified as 'woodland cover.'

City of Vaughan Official Plan

Based on a review of Schedule 2 (Natural Heritage Network) of the City of Vaughan Official Plan (2010) a portion of the study area is identified as 'Core Feature' of the Natural Heritage Network of the City of Vaughan.

TRCA Terrestrial Natural Heritage System

A portion of the study area is identified as a component of the TRCA Terrestrial Natural Heritage System including, 'Existing Natural Cover' and 'Potential Natural Cover.' Existing natural cover is identified as four different habitat types: forest, meadow, successional, and wetland.

Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses

The valleylands and wetlands associated with the watercourses in the study area are regulated areas under Ontario Regulation 166/06 (TRCA) Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses. A permit will be required from TRCA for development within these regulated areas. The regulated areas found within the study area are presented in **Figure 2.**

4.0 PROJECT DESCRIPTION

Teston Road from 250 m west of Pine Valley Drive to Kleinburg Summit Way currently exists as a two-lane, major collector road with a rural cross-section. Teston Road will continue to be a two-lane, major collector road; however, operational improvements will be implemented including conversion from a rural to an urban cross-section and the addition of dedicated bike lanes in each direction, with a sidewalk located on the south side. The right-of-way width of Teston Road is 26 m.

The culverts at the existing watercourse crossing will be replaced with open-footed box culverts. The existing 0.9 m diameter x 15.9 m long CSP culvert at Crossing 1 will be replaced with 4.267 m x 1.525 m x 28.93 m concrete box that will be oriented at a skew to the roadway to allow for a more natural flow pattern (currently there are two 90 degree “turns” in the watercourse upstream of Teston Road: one where the watercourse flows into the road slope and one where it enters the culvert). The new orientation will outlet at the same location that the existing culvert discharges. At Crossing 2, the existing 3.3 m x 1.0 m x 8.0 m long concrete box will be replaced with a 12.192 m x 1.525 m x 26.0 m concrete box at the same location. At Crossing 3, the existing 2.3 m diameter x 18.0 m long CSP culvert will be replaced by a 4.877 m x 1.83 m x 17.21 m concrete box culvert at the same location. To avoid impacts to the watercourse and fish habitat where Purpleville Creek abuts the road slope between Crossings 2 and 3, a retaining wall will be constructed along the south side of Teston Road. The dimensions of these new culverts will be confirmed during detail design in consultation with the City of Vaughan and Toronto and Region Conservation Authority.

Construction is anticipated to start between 2023 and 2026.

The cross-section for Teston Road is shown in **Figure 5**.

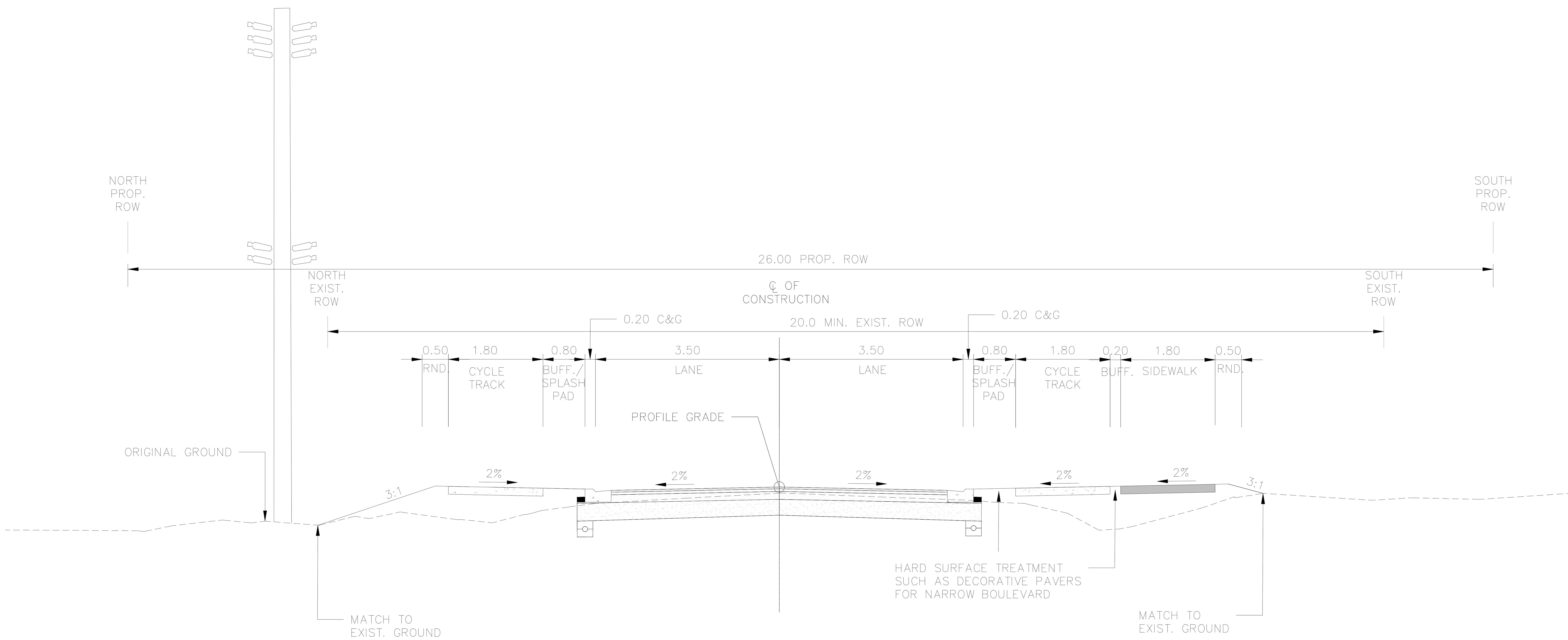
5.0 IMPACT ASSESSMENT AND ENVIRONMENTAL PROTECTION

This section focuses on the potential effects on significant environmental features and outlines the environmental protection/mitigation measures proposed to manage adverse effects related to terrestrial and aquatic ecosystems. Environmental effects are identified based on natural heritage issues/concerns anticipated associated with design plans and work zone impacts.

5.1 Aquatic Habitats and Communities

The improvements to Teston Road within the study area have the potential to result in impacts fish and fish habitat due to the following effects:

- temporary disruption or permanent loss of site-specific habitat;



TYPICAL SECTION - TESTON ROAD - OPTION 2A

N.T.S

KEY PLAN

CONTRACTOR'S NOTES:

1. ALL DIMENSIONS ARE IN METRES AND / OR MILLIMETRES UNLESS OTHERWISE INDICATED.
2. DRAWINGS ARE NOT TO BE SCALED.
3. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN THE FIELD AND SHALL REPORT ANY DISCREPANCIES TO THE ENGINEER IMMEDIATELY UPON FINDING.
4. THE EXACT LOCATION OF UTILITIES SHALL BE DETERMINED BY CONSULTING THE UTILITY COMPANIES CONCERNED. THE CONTRACTOR SHALL PROVE THE LOCATION OF UTILITIES AND SHALL BE RESPONSIBLE FOR ADEQUATE PROTECTION FROM DAMAGE.
5. BENCHMARKS FOR LAYOUT ARE TO BE OBTAINED FROM THE CITY OF VAUGHAN ENGINEERING DEPARTMENT.

NOTE:

EVERY REASONABLE EFFORT HAS BEEN MADE TO ENSURE THAT THE INFORMATION APPEARING ON THIS PLAN IS ACCURATE AND CURRENT. WE BELIEVE THE INFORMATION TO BE RELIABLE, HOWEVER, THE CITY OF VAUGHAN ASSUMES NO RESPONSIBILITY OR LIABILITY DUE TO ERRORS OR OMISSIONS.

NO.	DESCRIPTION	BY	DATE
8			
7			
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2			
1			

UPDATES & REVISIONS

ENGINEERING COMPANY NAME:

ENGINEER'S STAMP:

APPROVED AS TO FORM IN RELIANCE, UPON THE PROFESSIONAL SKILL AND ABILITY OF THE CONSULTING ENGINEERS AS TO DESIGN AND SPECIFICATIONS.

JACK GRAZIOSI, P.Eng., M.Eng.
DIRECTOR OF INFRASTRUCTURE DELIVERY

DATE

TESTON ROAD
ENVIRONMENTAL ASSESSMENT

TYPICAL SECTIONS

VAUGHAN
Infrastructure Delivery

DESIGNED & DRAWN BY: PYIP	CHECKED BY: AR	TENDER No. T18-___
SURVEYED BY: ___	APPROVED BY: ___	
SCALE: HORIZONTAL: N.T.S VERTICAL: N.T.S	PROJ. No. 18-______	DWG. No. _ of _

Printed: Aug. 12, 2021

- changes to water quality and quantity;
- changes in water temperature; and,
- barriers to fish passage.

As a result of recent changes to the *Fisheries Act*, DFO has introduced a self-assessment process for proponents to determine if a *Harmful Alteration, Disruption or Destruction* (HADD) 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. The works proposed at the watercourses summarized below do not meet the self-assessment criteria and a HADD to fish or fish habitat may occur. Further details regarding works, net environmental effects and site-specific mitigation proposed at the crossings can be found below.

The majority of the works associated with the culvert replacements will result in disturbance below the high water mark at the watercourses that support fish habitat (indirect and direct). There will be increases in footprints below the high water mark at all crossings, and the project will result in the net loss of fish habitat. The activities involved with the removal of the existing culverts and the construction of the new culverts necessitate review by DFO. In addition, the watercourses at Crossings 2 and 3 support Redside Dace, a federally (and provincially) endangered species that is protected under the *Species at Risk Act* (SARA). Based on the proposed works at the crossings supporting fish habitat, this project does not meet the self-assessment criteria as a HADD to fish or fish habitat may occur. In addition, Crossings 2 and 3 support an endangered species and its habitat. A 'Request for Review' submission to DFO to determine if an authorization under the *Fisheries Act* is required and to screen for effects on Redside Dace under SARA will be required during detailed design.

As the proposed works at Crossings 2 and 3 (and the works associated with the retaining wall between the crossings) are within occupied Redside Dace habitat, regulations under the Ontario *Endangered Species Act, 2007* (ESA) must be upheld and all works must be reviewed by the MECP. To determine if the proposed works contravene subsection (9)(1) or (10)(1) of the ESA, an 'Information Gathering Form (IGF)' and 'Avoidance Alternatives Form (AAF)' will be submitted to the MNRF to consider all alternatives that would not adversely affect species at risk (SAR) and their associated habitat. If the proposed works are in violation of the ESA, an 'Overall Benefit Permit (C-PAF)' under clause 17(2)(c) of the *Endangered Species Act, 2007* (ESA) is required through the MECP and will need to be completed during detailed design.

Further details regarding works, net environmental effects and site-specific mitigation proposed at the crossings can be found in the sections below. There is no fish habitat at Crossing 4 thus further review is not required.

5.1.1 Temporary Disruption or Permanent Loss of Site-Specific Habitat

The replacements of the existing culverts at Crossings 1-3 have the potential to result in the alteration of localized fish habitats. To minimize the potential for harm and maximize the benefit of replacements, the new culverts will be as short as possible with larger opening sizes to allow for more natural flow processes with no or minimal restrictions that could result in erosion and the degradation of fish habitat. All works will be performed in-the-dry by using temporary flow bypass systems and cofferdams to isolate the work areas. Construction will also be staged such that both water flow and traffic flow can be maintained.

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

- because of the presence of Redside Dace habitat to the study area, in-water work/work within riparian habitat should permitted from July 1 to September 15;
- work areas will be delineated with construction fencing to minimize the area of disturbance;
- appropriate sediment control structures will be installed prior to and maintained during construction to prevent entry of sediments into the watercourse;
- where cofferdams are to be employed, unwatering effluent will be treated prior to discharge to receiving watercourse;
- cofferdams will be constructed using pea gravel bags or equivalent to isolate the work area and maintain flow;
- where cofferdams are to be deployed, a fish screen will be used at the end of the dewatering pump to prevent fish impingement and/or entrainment;
- fish isolated by construction activities will be captured and safely released to the watercourse;
- 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.

5.1.2 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 isolation of the work areas behind cofferdams, the treatment of effluent from unwatering prior to its release back into the receiving watercourses, and the deployment and maintenance of erosion and sediment controls (silt fencing, flow checks, etc.) which will prevent sediments from reaching the watercourses from exposed soils upslope. To improve storm water quality, roadway runoff should be directed to existing storm water management (SWM) facilities where technically feasible and sufficient permanent pool volume is available within the SWM facility. Infiltration trenches should also be installed to treat water prior to it entering the watercourse. In addition, 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 watercourses.

5.1.3 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 storm water management strategies are implemented (see **Section 4.1.2**).

5.1.4 Barriers to Fish Passage

No barriers to fish passage will result from this project.

5.1.5 Restoration/Enhancement

The riparian areas at crossings supporting fish habitat may be affected by the culvert works and construction of retaining walls. Restoration, enhancement and/or compensation will focus on these main areas of impact. These areas include Redside Dace habitat as defined by MECP (vegetated areas within the meander belt width plus 30 m).

The goal of the restoration/enhancement plan is to provide an overall benefit to the watercourse at these locations through restoration of riparian habitat. Restoration of disturbed riparian areas associated with culverts and retaining wall works will focus on the replacement and enhancement of the riparian vegetation that will be affected by the proposed works. These restoration and enhancement works will increase the quality of habitat in relation to what is present by increasing riparian cover, enhance habitat diversity through plantings of species that provide allochthonous inputs, and provide good floodplain connectivity.

5.2 Vegetation and Vegetation Communities

Improvements to Teston Road from Pine Valley Drive to Kleinburg Summit Way have the potential to result in impacts to vegetation and vegetation communities. Effects on vegetation related to these modifications could include:

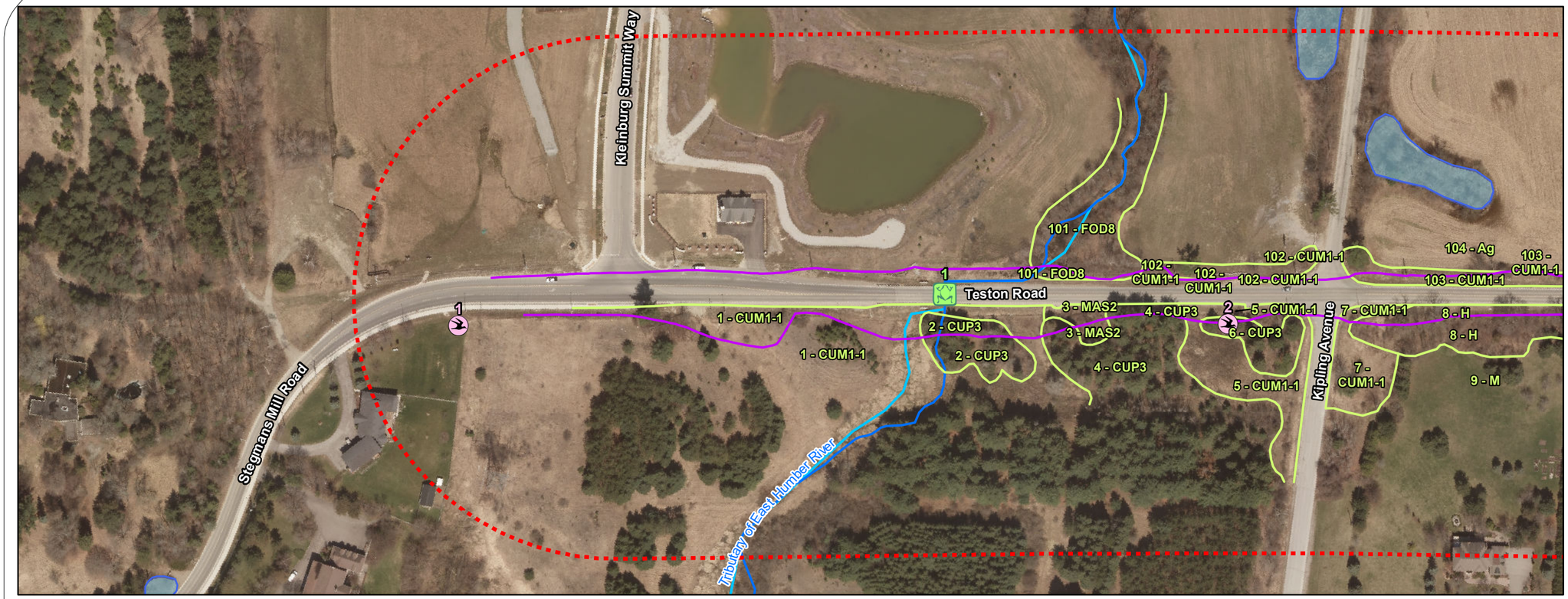
- displacement of / disturbance to vegetation and vegetation communities; and,
- displacement of rare, threatened or endangered vegetation of significant vegetation communities.

5.2.1 Displacement and/or Disturbance to Vegetation Communities/Vegetation

Clearing of vegetation will be required to accommodate the proposed improvements to Teston Road between Pine Valley Drive and Kleinburg Summit Way. The improvements to Teston Road will result in the removal of approximately 3.207 ha of naturalized and/or planted areas. The largest area of impact will be to lands that have been anthropogenically influenced, including cultural vegetation communities, agricultural and manicured areas. A total of 3.14 ha of anthropogenically influenced lands will be removed as a result of the proposed improvements. In addition, a total of 0.04 ha and 0.027 ha of forest and wetland communities will be removed, respectively. **Table 10** provides a summary of the total area of vegetation communities that will be removed for the improvements to the Teston Road. **Figure 6** shows the location of vegetation removals based on the preliminary design grading limits.

Cultural Vegetation Communities

A total of four cultural community types will be impacted as a result of the proposed improvements to Teston Road. These include: Dry-Moist-Old Field Meadow (CUM1-1), Coniferous Plantation (CUP3 and CUP3-2), Mineral Cultural Thicket (CUT1), and Mineral Cultural Woodland (CUW1). As noted in **Table 10**, the largest impact will occur to the cultural meadow communities with a total removal of 0.96 ha. In general, impacts to the cultural vegetation communities will include the removal of narrow swaths of vegetation located adjacent to the existing Teston Road right-of-way.



LEGEND

- Amphibian Monitoring Station
- Bird Monitoring Station
- Watercourse (MNRF)
- Watercourse (TRCA)
- Waterbody
- Study Area
- Area of Impact (Grading Limit)

Vegetation Community

- Vegetation Community Boundary

Ag	Agriculture
CUM1-1	Dry-Moist Old Field Meadow Type
CUP3	Coniferous Plantations
CUP3-2	White Pine Coniferous Plantation Type
CUT1	Mineral Cultural Thicket Ecosite
CUW1	Mineral Cultural Woodland Ecosite
FOD7-3	Fresh-Moist Willow Lowland Deciduous Forest Type
FOD8	Fresh-Moist Poplar-Sassafras Deciduous Forest Ecosite
FOM	Mixed Forest
H	Hedgerow
M	Manicured
MAM	Meadow Marsh
MAS2	Mineral Shallow Marsh Ecosite
OAO	Open Aquatic

Data sources: LGL Limited field surveys, Ministry of Natural Resources and Forestry, Contains information licenced under the Open Government Licence - Ontario.

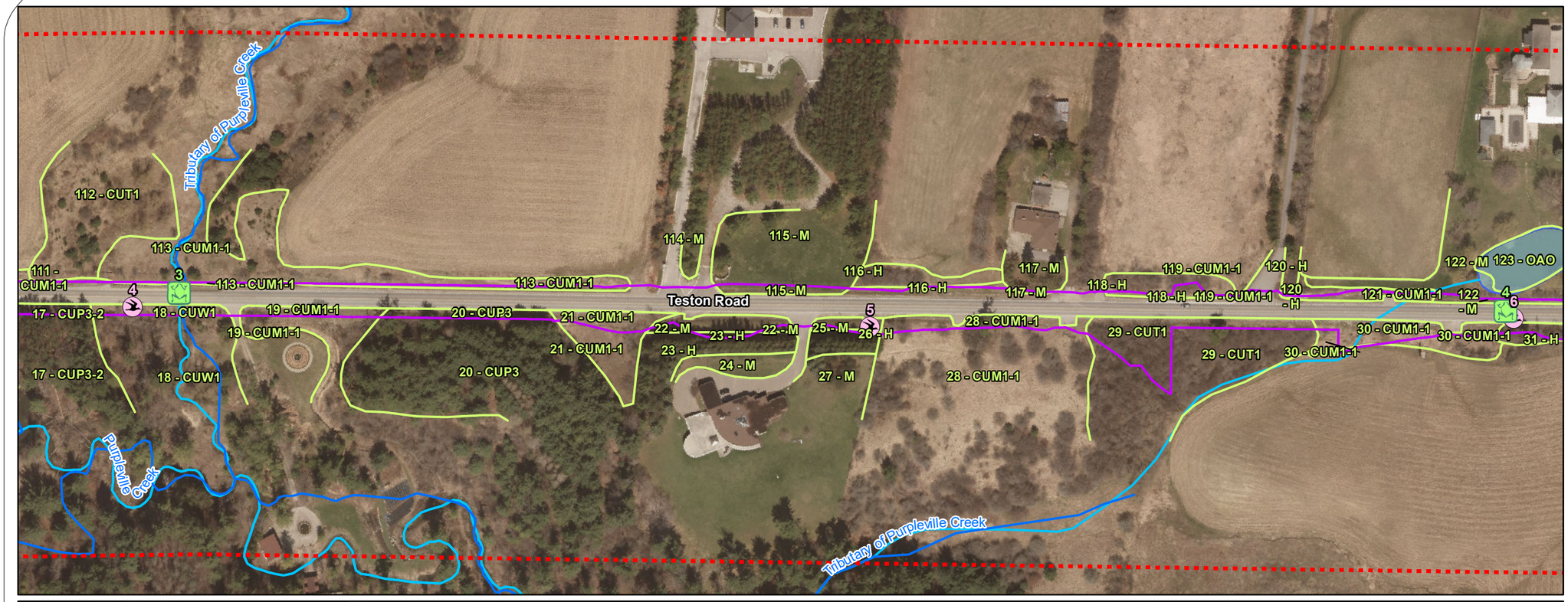
0 15 30 60 90 m

N

Teston Road
Vegetation Removals

LGL LIMITED environmental research associates — CELEBRATING 50 YEARS

Project:	TA9006	**Figure:**	6a
Date:	March 2, 2022	**Prepared By:**	AM
Scale:	1:2,100	**Verified By:**	GNK



LEGEND

- Amphibian Monitoring Station
- Bird Monitoring Station
- Watercourse (MNRF)
- Watercourse (TRCA)
- Waterbody
- Study Area
- Area of Impact (Grading Limit)

Vegetation Community

- Vegetation Community Boundary
- **Ag** Agriculture
- **CUM1-1** Dry-Moist Old Field Meadow Type
- **CUP3** Coniferous Plantations
- **CUP3-2** White Pine Coniferous Plantation Type
- **CUT1** Mineral Cultural Thicket Ecosite
- **CUW1** Mineral Cultural Woodland Ecosite
- **FOD7-3** Fresh-Moist Willow Lowland Deciduous Forest Type
- **FOD8** Fresh-Moist Poplar-Sassafras Deciduous Forest Ecosite
- **FOM** Mixed Forest
- **H** Hedgerow
- **M** Manicured
- **MAM** Meadow Marsh
- **MAS2** Mineral Shallow Marsh Ecosite
- **OAO** Open Aquatic

Data sources: LGL Limited field surveys, Ministry of Natural Resources and Forestry, Contains information licenced under the Open Government Licence - Ontario.

0 15 30 60 90 m

N

Teston Road
Vegetation Removals

LGL LIMITED environmental research associates — CELEBRATING 50 YEARS

Project:	TA9006	**Figure:**	6b
Date:	March 2, 2022	**Prepared By:**	AM
Scale:	1:2,100	**Verified By:**	GNK

TABLE 10.
IMPACTS TO VEGETATION COMMUNITIES WITHIN THE STUDY AREA

Vegetation Community Type	Vegetation Community	Total Area (ha) to be Impacted
Cultural	Dry-Moist Old Field Meadow (CUM1-1)	0.96
	Coniferous Plantation (CUP3 and CUP3-2)	0.12
	Mineral Cultural Thicket (CUT1)	0.16
	Mineral Cultural Woodland (CUW1)	0.03
	Sub-total	**1.27**
Forest	Fresh-Moist Willow Lowland Deciduous Forest (FOD7-3)	0.03
	Fresh-Moist Poplar Deciduous Forest (FOD8)	0.01
	Sub-total	**0.04**
Wetland	Meadow Marsh (MAM)	0.007
	Mineral Shallow Marsh (MAS2)	0.02
	Sub-total	**0.027**
Human Influenced Lands	Agriculture	1.55
	Manicured/Hedgerow	0.32
	Sub-total	**1.87**
	Total Area	**3.207**

Overall, impacts resulting in the loss of vegetation within these cultural communities are considered to be minor. Cultural vegetation 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 tolerant of these conditions. It is expected that plant species displaced and / or disturbed within the cultural communities due to the Teston Road improvements will re-colonize available lands adjacent to the new right-of-way post-construction.

Forest Communities

A total of 0.03 ha and 0.01 ha of Fresh-Moist Willow Lowland Deciduous Forest (FOD7-3) and Fresh-Moist Poplar Deciduous Forest (FOD8-1) will be removed as a result of the proposed improvements to Teston Road, respectively. Impacts to the deciduous forest communities will include the removal of a small portion of the community located

adjacent to the existing right-of-way creating a new forest edge. New forest edges are exposed to greater potential for non-native and invasive species infiltration further into the forest, and as such, implementation of a forest management plan in accordance with the TRCA guidelines is recommended. Recommended forest edge management measures are outlined below.

All of the forest communities located within the study area are widespread throughout Ontario and the loss of a small portion along the edge of these vegetation communities is not expected to have any negative impacts to the remaining forest communities.

Wetland Communities
A total of 0.04 ha of wetland vegetation communities will be removed as a result of the proposed improvements to Teston Road. Impacts to the wetland communities will generally result in the removal of a narrow strip along the edge of the communities located within the new right-of-way. It is anticipated that these wetlands will continue to persist post-construction. Edge management techniques using suitable plant species should be employed to mitigate any negative impacts to these vegetation communities. During detail design, appropriate edge management measures should be developed.

Human Influenced Lands
As noted in **Table 10**, a total of 1.55 ha and 0.32 ha of agriculture and manicured/ hedgerow lands will be removed as a result of the proposed improvements to the Teston Road, respectively. The overall significance of the impact to these lands is considered low.

5.2.2 Displacement of 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. No plant species that are regulated under the Ontario *Endangered Species Act, 2007* or the Canada *Species at Risk Act* were observed during LGL's botanical investigation. In addition, no plant species that are provincially ranked as "critically imperilled" to "vulnerable" (S1 to S3) were observed within the study area. As a result, there will be no impacts on rare, threatened or endangered vegetation and vegetation communities.

As noted in **Section 3.3.4**, a total four plant species considered rare in York and by TRCA were identified in the study area. **Table 4** presents a list of these species. It is recommended that the regionally and locally rare plant species be retained, to the extent possible. If impacts are unavoidable, it is recommended that regionally and locally significant plant species, including individual shrub and trees that measure less than 10 cm DBH, be transplanted into suitable habitat conditions. Where possible, these

plants should be transplanted into the newly created edges of those impacted communities, but outside the limit of disturbance.

5.2.3 Mitigation

Impacts to wetland and forest communities within the study area will primarily result in the removal of a narrow strip of the community edge adjacent to Teston Road resulting in the creation of new community edges. Edge management should be implemented to protect the new community edge, although the total encroachment into existing forest and wetlands is considered negligible.

Edge Management

The TRCA *Forest Edge Management Plan Guidelines* (2004) shall be adhered to. Where new forest edges are exposed, forest management techniques will be implemented to mitigate the associated impacts to the forest communities. As part of the forest edge management, mitigation measures will include, but not be limited to, the following:

- Planting of appropriate native trees, shrubs and ground flora which shall be undertaken as soon as possible following vegetation removals. Plantings along the disturbed forest edges will provide a protective buffer. Newly exposed forest edges become exposed to a greater potential for aggressive and invasive species infiltration further into the forest interior causing greater impacts. Micro-habitat conditions are also altered due to a greater incident of light penetrating further into the forest resulting in decreased soil moisture and increased windthrow. Plant species used within the buffer shall be somewhat similar to those in the adjacent habitat and be non-invasive in nature;
- Grading within areas where edges will be newly created shall be designed to meet existing grades a minimum of 3.0 m away from the tree drip-line;
- Compaction of soils on lands immediately adjacent to the newly exposed forest edge will be minimized to the extent possible. Construction activities can result in cut roots, and soil compaction due to re-grading and fill placement. Cut tree roots can reduce a tree's capacity to uptake and transfer water and nutrients, and soil compaction can result in a decrease in air spaces within the soil which can reduce the infiltration capacity of the soil, limits soil oxygen and limits root penetration. Decompaction efforts and methodology shall be site specific. Where decompaction is required, it shall extend to a minimum depth of approximately 25 cm;

- Drainage patterns adjacent to newly created edges shall be maintained to avoid changes in soil moisture, this is especially important around wetland areas and forest communities with substrates that maintain increased moisture capacity;
- A plan must be in place to immediately mitigate the spread/invasion of aggressive plant species; and,
- A monitoring plan must be developed to ensure that the newly planted material survives and fulfils the intended function and to ensure that the inadvertent spread of aggressive or non-native plant species is appropriately managed.

During the detail design phase, a forest edge management plan shall be prepared for those communities where forest edge management is recommended.

Invasive Species Management
Efforts to control non-native and invasive plant species that have become established, as well as prevent the establishment of new non-native and invasive plant species at a minimum should include the following:

- minimize the exposure of bare soil, where bare soil must persist over a period of time these should be planted with a non-invasive annual cover crop for an interim period; and,
- no non-native and invasive ornamentals plants should be used for landscaping (e.g., Norway maple, purple loosestrife, Japanese knotweed, Japanese honeysuckle, etc.).

In addition, 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 for Industry* (Halloran, Anderson and Tassie 2013) and at a minimum should include sanitation of construction vehicles and equipment prior to leaving and moving to the next site. A cleaning station should be set up, so vehicles and equipment can be inspected and cleaned regularly.

Construction Best Management Practices
At a minimum, the following mitigation measures will be implemented during construction:

- vegetation cover will be used to protect any exposed surfaces in accordance with OPSS 804 -Construction Specification for Seed and Cover;
- topsoil from stockpiles to be in accordance with OPSS 802 - Construction Specification for Topsoil;

- old field seed mix and mulching or erosion control blanket will be placed in areas of soil disturbance to provide adequate slope protection and long-term slope stabilization; and,
- tree protection to be in accordance with OPSS 801 - Construction Specification for the Protection of Trees or the City of Vaughan specifications.

5.4 Wildlife and Wildlife Habitat

Improvements to Teston Road from west of Kleinburg Summit Way to west of Pine Valley Drive have the potential to impact wildlife and wildlife habitat. Effects on wildlife and wildfire habitat related to these improvements which include road widening in some sections could include:

- displacement of wildlife and wildlife habitat;
- barrier effects on wildlife passage;
- wildlife/vehicle conflicts;
- wildlife passage considerations for enhanced functionality;
- disturbance to wildlife from noise, light and visual intrusion;
- potential impacts to migratory birds; and
- displacement of rare, threatened or endangered wildlife and significant wildlife habitat.

5.4.1 Displacement of Wildlife and Wildlife Habitat

Improvements to Teston Road will take place within and beyond the existing right-of-way. Much of the right-of-way and lands immediately adjacent consist of disturbed low quality wildlife habitat, with higher quality forested and/or aquatic habitats associated with tributaries of the East Humber River and Purpleville Creek. There are a total of four watercourses that cross Teston Road within the study area including: Tributary of the East Humber River (Crossing 1); Purpleville Creek (Crossing 2); and, two tributaries of Purpleville Creek (Crossings 3 and 4).

Only minimal infringement to the edges of forested communities will occur as a result of road modifications and widening; the greatest of these minor impacts will be to the Cultural Plantations, Cultural Woodland and Deciduous Forest adjacent to Teston Road. Modification and widening of Teston Road within and beyond the right-of-way is not expected to have any significant impact on wildlife and/or wildlife habitat.

5.4.2 Barrier Effects on Wildlife Passage

Natural areas are associated with Crossing 1 (tributary of the East Humber River), Crossing 2 (Purpleville Creek) and Crossing 3 (tributary of Purpleville Creek). These

three crossings may meet criteria for 'important wildlife corridors' based on the Crossings Guideline for Valley and Stream Corridors (TRCA 2015). Natural heritage function objectives identified in the TRCA document were also considered and crossing designs have taken into account these objectives as they pertain to wildlife movement and landscape connectivity.

No new permanent movement barriers to wildlife will be created as a result of road modifications and widening within the study area. Given the existing disturbance to wildlife movement by Teston Road, the proposed road improvements are not expected to have a significant cumulative impact on wildlife passage. Consideration of wildlife movement has been addressed as part of the improved Teston Road design with culvert lengths being maintained or extensions being minimized, replacement of existing culverts with larger structures (e.g., Crossing 1 and Crossing 3) and placement of natural substrates and cover vegetation in and around structures (see below). The replacement of the structure at Crossing 1 (tributary of the East Humber River) will involve the removal of the existing CSP that has a diameter of 0.9 m and a length of 15.9 m which will be replaced with an open bottom concrete box culvert that will have a height 1.5 m, width of 12.2 m and a length of 28.9 m. Crossing 2 (Purpleville Creek) will involve the removal of the existing concrete box culvert that has a height of 1.0 m, width of 3.0 m and a length of 8.4 m which will be replaced with a concrete box culvert that will have a height 1.5 m, width of 12.2 m and a length of 26.0 m. Crossing 3 (tributary of Purpleville Creek) will involve the removal of the existing CSP that has a diameter of 2.4 m and a length of 18.43 m which will be replaced with an open bottom concrete box culvert that will have a height 1.83 m, width of 4.9 m and a length of 17.21 m. All proposed crossing modifications, change in opportunity for wildlife movement and considerations for wildlife movement are summarized below (see **Table 7**). Overall, these structures are expected to maintain or increase safe opportunities for wildlife crossing in the section of Teston Road from just west of Kleinburg Summit Way to just west of Pine Valley Drive, by small, medium and large animals; this will result in a net overall improvement to wildlife passage than currently exists within this part of the study area.

As part of this study, an analysis of the openness ratios has been undertaken and is presented in the following section. Where the openness ratio or type of structure is being increased or changed over existing conditions, improvement in wildlife passage may be expected.

Wildlife Openness Ratio Comparison

Openness ratio (OR) is a calculation which is used to determine the tunnel effect created by a structure and thus the likelihood wildlife species would utilize that structure. This evaluation is completed by analysing a structure's component measurements (i.e.,

height x width / structure length). Generally, a greater openness ratio value is expected to increase the likelihood of wildlife utilization of a given structure or culvert. To maximize the openness ratio, structures should be designed to have a larger opening and the shortest length possible, since wildlife species are more likely to enter a culvert if they can see light at the other end. Of course, external considerations (e.g., engineering, utilities, hydrology and cost) may influence structure size and type selected.

Minimum OR was determined by a review of secondary source data regarding wildlife passage at road crossings. The minimum OR for small sized animals (e.g., mouse, vole and squirrel) (CVC 2017), medium sized animals (e.g., red fox) should be 0.4, and the minimum OR for large sized animals (e.g., deer) should be 0.75 (Cavallaro et al. 2005). Research indicates that small mammals prefer small diameter openings (e.g., concealment may decrease exposure to predation), and subsequently, smaller OR structures (Ministry of Transportation, 2006). The following minimum clearance heights recommended for structures that will provide passage for large, medium and small sized animals is as follows: 2 m, 1 m, and 0.3 m, respectively (Cavallaro et al. 2005).

Wildlife Passage Analysis

An analysis of the four watercourse crossing structures present within the study area was undertaken with the purpose of understanding their current function to provide wildlife passage and to determine their expected function based on the proposed improvements to Teston Road (see **Table 11**). Many of the crossings examined (i.e., Crossings 1, 2 and 3) support moderate functionality for wildlife movement across the broader landscape, taking into account the existing conditions within the study area and surrounding human development and anthropogenic influences. Structure sizes (and similarly openness ratio) influences the wildlife assemblage that is able to take advantage of a given crossing structure. Generally, the existing structures present within the study area are relatively small and are only suitable for medium and small animals, with the potential for large animals to take advantage of only one structures (Crossing 3). All proposed crossing modifications, existing and change in opportunity for wildlife movement and openness ratios are summarized below (see **Table 11**).

5.4.3 Wildlife/Vehicle Conflicts

The proposed road modifications and widening will increase the width of the travelled surface resulting in an increased risk of mortality for wildlife that elects to cross the roads. The existing Teston Road right-of-way poses a potential barrier to wildlife movement. While the increase in width of road increases exposure of wildlife to vehicle conflicts, the potential increase in wildlife mortality above existing conditions is considered minor.

Where the openness ratio (culvert width x height / length) is being increased at culverts, improvement in wildlife passage can be expected. Construction duration and disturbance in the vicinity of culverts and bridges should be minimized to the extent possible to reduce the potential for increase in road mortality caused by wildlife avoidance of these structures.

5.4.4 Wildlife Passage Considerations for Enhanced Functionality

Vegetation Planting at Wildlife Crossing Structures

Low stature vegetation is considered an important component of wildlife crossing use by reptiles, amphibians and small mammals (Cavallaro et al. 2005). Bare and exposed earth surrounding the entrance to a wildlife passage will deter use by wildlife as a result of perceived vulnerability to predators. To the extent possible, all existing natural vegetation should be salvaged surrounding all crossing locations outlined in **Table 11**, above. Where vegetation has been removed or is found to be absent, in the immediate vicinity of crossings identified in **Table 11**, planting of low stature vegetation (e.g., grasses and small shrubs) should occur. Shrubs should be spaced apart from one another by approximately 3-5 m, as to not cause a visual obstruction of the wildlife crossing structure.

Substrate Materials within Wildlife Crossing Structures

Natural substrates should be used to encourage wildlife to utilize crossing structures. Ground cover should be continuous with the substrates found outside and adjacent to the structural entrances thereby encouraging animals to pass through the structure. Substrates covering the ground within and surrounding the crossing structures (see **Table 11**) should contain a mix of soil and small granular materials, matching what is found on lands surrounding the crossing structures (locally excavated soils is recommended).

TABLE 11.
WILDLIFE PASSAGE ANALAYSIS FOR STRUCTURES WITHIN THE STUDY AREA

Structure/ Watercourse	Existing Wildlife Corridor Potential	Existing Structure		EA Recommended Structure		Net Change
		Structure Type/Dimensions (HxW/L)	Openness Ratio/Suitability for Wildlife Passage	Structure/Type Dimensions (HxW/L)	Openness Ratio/Suitability for Wildlife Passage	
Crossing 1 (Tributary of the East Humber River)	Moderate – narrow deciduous forest corridor present immediately north of Teston Road and a mix of plantation, meadow and small marsh habitat found immediately south of Teston Road. Looking at a broader landscape scale, opportunity for wildlife movement is limited due to extensive residential development found beyond the right-of-way, despite extensive natural area being found to the south. Wildlife assemblage expected to be composed largely of small and medium sized animals with limited potential for large animal movement.	CSP - diameter of 0.9 m and a length of 15.9 m	0.23 – suitable for passage of medium and small animals and potential for use by large animals.	Open bottom concrete box culvert – height of 1.5 m, width of 12.2 m and a length of 28.9 m	0.23 – suitable for passage of small animals and some potential for medium sized animals.	Slight increase in openness ratio; however, modest change in function for wildlife movement anticipated.

TABLE 11.
WILDLIFE PASSAGE ANALAYSIS FOR STRUCTURES WITHIN THE STUDY AREA

Structure/ Watercourse	Existing Wildlife Corridor Potential	Existing Structure		EA Recommended Structure		Net Change
		Structure Type/Dimensions (HxW/L)	Openness Ratio/Suitability for Wildlife Passage	Structure/Type Dimensions (HxW/L)	Openness Ratio/Suitability for Wildlife Passage	
Crossing 2 (Purpleville Creek)	Moderate - natural area present adjacent to Teston Road (north and south); furthermore, at a broader scale, opportunity for wildlife movement extends across the landscape to the north and south. Wildlife assemblage expected to be composed largely of small and medium sized animals with moderate potential for large animals.	Box culvert - height of 1.0 m, width of 3.0 m and a length of 8.4 m	0.36 – openness ratio does not meet required minimum for medium and large animals, meets required minimum for small animals with potential for use by some medium animals.	Concrete box culvert - height 1.5 m, width of 12.2 m and a length of 26.0 m	0.72 - openness ratio meets required minimum for large, medium and small animals; however, minimum structure height for large animals is not achieved.	Significant increase in openness ratio and significant change in opportunity for wildlife movement expected.
Crossing 3 (tributary of Purpleville Creek)	Moderate - natural area present adjacent to Teston Road (north and south); furthermore, at a broader scale, opportunity for wildlife movement extends across the landscape to the north and south, with some encroachment by human development. Wildlife assemblage expected to be composed largely of small and medium sized animals with moderate potential for large animals.	CSP - diameter of 2.4 m and a length of 18.43 m	0.98 - openness ratio does not meet required minimum for large animals but does meet the criteria for medium and small animals.	Open bottom concrete box culvert - height 1.83 m, width of 4.9 m and a length of 17.21 m	0.51 - openness ratio does not meet required minimum for large animals but does meet the criteria for medium and small animals.	Decrease in openness ratio; however, replacement of a CSP structure with an open bottom box culvert may provide additional opportunity for wildlife movement.

5.4.5 Disturbance to Wildlife from Noise, Light and Visual Intrusion

Noise, light and visual intrusion may alter wildlife activities and patterns. In urban settings, such as the study area, wildlife has become acclimatized to urban conditions and only those fauna that are tolerant of human activities remain. Minor edge effect to forested communities may occur as road widening will result in an increase in noise, light, and visual intrusion. Given that wildlife are acclimatized to the presence of the existing Teston Road right-of-way in the study area, the tolerance of the wildlife assemblage to human activities and the limited zone of influence of the proposed widening, disturbance to wildlife from noise, light and visual intrusion will have no significant adverse effects.

5.4.6 Potential Impacts to Migratory Birds

Numerous bird species listed under the *Migratory Birds Convention Act* (MBCA) are located within the study area. The MBCA prohibits the killing, capturing, injuring, taking or disturbing of migratory birds (including eggs) or the damaging, destroying, removing or disturbing of nests. While migratory insectivorous and non-game birds are protected year-round, migratory game birds are only protected from March 10 to September 1. To comply with the requirements of the MBCA, disturbance, clearing or disruption of vegetation where birds may be nesting should be completed outside the window of April 1 to July 31. In the event that these activities must be undertaken between April 1 and July 31, a nest survey will be conducted by a qualified avian biologist to identify and locate active nests of species covered by the MBCA. If an active nest is located, a mitigation plan shall be developed and provided to Environment Canada – Ontario Region for review prior to implementation. No nests of migratory bird species were found under bridge or culvert structures.

5.4.7 Displacement of Rare, Threatened or Endangered Wildlife or Significant Wildlife Habitat

As noted in **Section 3.4.4**, species at risk screening identified 24 species which have the potential to be found within the study area based on secondary source records. Eighteen of which are listed as ndangered or threatened (i.e., regulated species) under the Ontario *Endangered Species Act, 2007* (ESA). Of these, nine species have moderate or high potential or were confirmed to occur in the study area (see below). A summary of all SAR identified through secondary source records, their potential to exist within the study area, targeted survey requirements, and proposed mitigation is presented in **Table 12**.

TABLE 12.
SPECIES AT RISK ANTICIPATED IMPACTS AND PROPOSED SURVEY REQUIREMENTS AND MITIGATION

Common Name	Scientific Name	*Species at Risk Act* (Sch 1)	*Endangered Species Act*	Potential to Occur	Rationale for Potential to Occur	Impacts Anticipated (if present)	Targeted Surveys/Mitigation Development Required During D.D.
Monarch	*Danaus plexippus*	SC	SC	Moderate	Several fields on the site, which have meadow boundaries that have some milkweed.	No/minor (edge) impacts anticipated.	Yes, seed mix consideration to provide benefit to this species.
Rapids Clubtail	*Gomphus quadricolor*	END	END	High	Local NHIC record from 2015, may use East Humber River Tributaries within Study area.	No/minor (edge) impacts anticipated.	Consideration for targeted surveys shall be considered.
Rusty-patched Bumble Bee	*Bombus affinis*	END	END	Moderate	NHIC record from 1993, but no record on BumbleBee Watch. Could use a variety of habitats in the Study area.	No/minor (edge) impacts anticipated.	Consideration for targeted surveys shall be considered.
Bank Swallow	*Riparia riparia*	THR	THR	Low	Although there are banks along the East Humber River, studies within the Study area did not identify this species or nesting adjacent to the road.	No impacts anticipated.	No targeted surveys anticipated. Review of riparian habitats to screen for nests/nesting colonies. Develop appropriate mitigation if present.

TABLE 12.
SPECIES AT RISK ANTICIPATED IMPACTS AND PROPOSED SURVEY REQUIREMENTS AND MITIGATION

Common Name	Scientific Name	*Species at Risk Act* (Sch 1)	*Endangered Species Act*	Potential to Occur	Rationale for Potential to Occur	Impacts Anticipated (if present)	Targeted Surveys/Mitigation Development Required During D.D.
Barn Swallow	*Hirundo rustica*	THR	THR	Confirmed	This species was observed within the horse pastures at the east end of the Study area, north of Teston Road. The birds were flying into and out of the horse shelters which may be used for nesting.	No impacts anticipated.	No targeted surveys anticipated. Review of culvert structures to screen for nests. Develop appropriate mitigation if present.
Bobolink	*Dolichonyx oryzivorus*	THR	THR	Confirmed	This species was identified at the east end of the project, north of Teston Road in the hay fields.	No/minor (edge) impacts anticipated.	No targeted surveys anticipated. Review of habitat conditions and development of mitigation to protect species/habitat.
Canada Warbler	*Cardellina canadensis*	THR	SC	Low	There is suitable habitat located within the natural areas south of Teston Road and along the East Humber River Tributaries, but this species was not detected during Breeding Bird Surveys from the road.	No impacts anticipated.	No targeted surveys required.

TABLE 12.
SPECIES AT RISK ANTICIPATED IMPACTS AND PROPOSED SURVEY REQUIREMENTS AND MITIGATION

Common Name	Scientific Name	*Species at Risk Act* (Sch 1)	*Endangered Species Act*	Potential to Occur	Rationale for Potential to Occur	Impacts Anticipated (if present)	Targeted Surveys/Mitigation Development Required During D.D.
Chimney Swift	*Chaetura pelagica*	THR	THR	Low	The buildings within the Study area may have suitable chimneys, but they are set back from the road. The species was not identified during Breeding Bird Surveys from the road.	No impacts anticipated.	No targeted surveys required.
Eastern Meadowlark	*Sturnella magna*	THR	THR	Confirmed	This species was identified at the east end of the project, north of Teston Road in the hay fields.	No/minor (edge) impacts anticipated.	No targeted surveys anticipated. Review of habitat conditions and development of mitigation to protect species/habitat.
Eastern Wood-pewee	*Contopus virens*	SC	SC	Low	There is suitable habitat within the Study area. The species was not identified during Breeding Bird Surveys from the road.	No impacts anticipated.	No targeted surveys required.
Wood Thrush	*Hylocichla mustelina*	THR	SC	Low	There is suitable habitat within the Study area. The species was not identified during Breeding Bird Surveys from the road.	No impacts anticipated.	No targeted surveys required.

TABLE 12.
SPECIES AT RISK ANTICIPATED IMPACTS AND PROPOSED SURVEY REQUIREMENTS AND MITIGATION

Common Name	Scientific Name	*Species at Risk Act* (Sch 1)	*Endangered Species Act*	Potential to Occur	Rationale for Potential to Occur	Impacts Anticipated (if present)	Targeted Surveys/Mitigation Development Required During D.D.
Eastern small-footed myotis	*Myotis leibii*	—	END	Low	No suitable rock piles were identified for roosting and no potential hibernacula were identified in the study area.	No impacts anticipated.	No targeted surveys required.
Little brown myotis	*Myotis lucifugus*	END	END	Moderate	Several houses and other buildings are in the Study area, but not close to Teston Road. Several trees are close to the road, but none were specifically classified as bat trees in the tree inventory. No potential hibernacula were identified in the Study area.	No/minor impacts anticipated.	Review of habitat conditions (using standardized protocols) and development of mitigation to protect species/habitat.
Tri-colored bat	*Perimyotis subflavus*	END	END	Moderate	Several trees are close to the road, but none were specifically classified as bat trees in the tree inventory. No potential hibernacula were identified in the Study area.	No/minor impacts anticipated.	Review of habitat conditions (using standardized protocols) and development of mitigation to protect species/habitat.

TABLE 12.
SPECIES AT RISK ANTICIPATED IMPACTS AND PROPOSED SURVEY REQUIREMENTS AND MITIGATION

Common Name	Scientific Name	*Species at Risk Act* (Sch 1)	*Endangered Species Act*	Potential to Occur	Rationale for Potential to Occur	Impacts Anticipated (if present)	Targeted Surveys/Mitigation Development Required During D.D.
Northern myotis	*Myotis septentrionalis*	END	END	Moderate	Several trees are close to the road, but none were specifically classified as bat trees in the tree inventory. No potential hibernacula were identified in the Study area.	No/minor impacts anticipated.	Review of habitat conditions (using standardized protocols) and development of mitigation to protect species/habitat.
American ginseng	*Panax quinquefolius*	END	END	Low	Considered historic in Leslie (2018). Not identified during botanical inventory.	No impacts anticipated.	No targeted surveys required.
Broad beech fern	*Phegopteris hexagonoptera*	—	SC	Low	Considered historic in Leslie (2018). Not identified during botanical inventory.	No impacts anticipated.	No targeted surveys required.
Butternut	*Juglans cinerea*	END	END	Low	Not identified during botanical inventory.	No impacts anticipated.	No targeted surveys required.
Common hoptree	*Ptelea trifoliata*	SC	SC	Low	Not identified during botanical inventory.	No impacts anticipated.	No targeted surveys required.
Dense blazing star	*Liatris spicata*	THR	THR	Low	Not identified during botanical inventory.	No impacts anticipated.	No targeted surveys required.
Eastern prairie fringed-orchid	*Platanthera leucophaea*	END	END	Low	Not identified during botanical inventory.	No impacts anticipated.	No targeted surveys required.

TABLE 12.
SPECIES AT RISK ANTICIPATED IMPACTS AND PROPOSED SURVEY REQUIREMENTS AND MITIGATION

Common Name	Scientific Name	*Species at Risk Act* (Sch 1)	*Endangered Species Act*	Potential to Occur	Rationale for Potential to Occur	Impacts Anticipated (if present)	Targeted Surveys/Mitigation Development Required During D.D.
Purple twayblade	*Liparis liliifolia*	THR	THR	Low	Not identified during botanical inventory.	No impacts anticipated.	No targeted surveys required.
Red mulberry	*Morus rubra*	END	END	Low	Considered historic in Leslie (2018). Not identified during botanical inventory.	No impacts anticipated.	No targeted surveys required.

Rapids Clubtail

Rapids Clubtail may occur along the East Humber River. There is a record on NHIC of this species in the square for this area from June 4, 2015, but the exact location is not known. Targeted surveys for this should occur during detail design to determine if the species could be impacted by the proposed improvements to Teston Road.

Rusty-patch Bumble Bee

Rusty-patch Bumble Bee was documented in NHIC in this area in 1993, but there are no records of this species on the more current iNaturalist or Bumble Bee watch and it was not observed in the field, although there were no targeted survys for this species. Targeted surveys for this should occur during detail design to determine if the species could be impacted by the proposed improvements to Teston Road.

Barn Swallow

Barn Swallow was observed flying within the horse pasture fields north of Teston Road on the east end of the study area and flying in and out of the horse shelters where they were presumably nesting. Given that these shelters are set far back from the road, no impacts to this species are anticipated. No use of culvert structures in the study area was identified during surveys; however, during detail design, structures should be re-examined to ensure this species is not present.

Bobolink and Eastern Meadowlark

Bobolink and Eastern Meadowlark were identified singing and presumably nesting in the hay fields north of Teston Road on the east end of the study area. The exact nest locations were not confirmed because access was not available for this field, but they appeared to be set back from the road. No targeted surveys are anticipated during detail design; however, review of habitat conditions and development of appropriate mitigation to protect species/habitat may be required.

Bat Species

Little Brown Myotis, Northern Myotis and Tri-colored Bat all use trees as maternity roosts. There are many mature trees within or immediately adjacent to the study area within the woodlands or in yards. Review of habitat conditions, using standardized protocols (i.e., MECP protocol), and development of mitigation to protect species/habitat should be considered during detail design.

5.5 Designated Natural Areas

Pockets of the East Humber River Provincially Significant Wetland Complex (PSW) are located within or near the study area. Several small pockets are located north of Teston Road at Kipling Avenue and a large pocket is located east of the study area at Pine Valley Drive. These wetland pockets typically comprise shallow marsh community (MAS2) based on LGL's botanical field investigations. The limits of the PSW found within the study area are presented in **Figure 4**. There are no Areas of Natural and Scientific Interest (ANSIs) or Environmentally Sensitive Areas (ESAs) located within the study area.

The entire study area is identified as 'Protected Countryside' under the Greenbelt Plan. The limits of this designation are presented in **Figure 4**.

Based on a review of Map 2 (Regional Greenlands System) of the York Region Official Plan (2010) the entire study area is within the Regional Greenlands System of York Region (**Figure 4**). In addition, based on a review of Map 5 (Woodlands) the forest and woodland communities within the study area are identified as 'woodland cover.'

Based on a review of Schedule 2 (Natural Heritage Network) of the City of Vaughan Official Plan (2010) a portion of the study area is identified as 'Core Feature' of the Natural Heritage Network of the City of Vaughan.

The wetlands and valleylands associated with the watercourses are located within regulated areas under Ontario Regulation 166/06 of the Toronto and Region Conservation Authority commonly known as Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses.

A portion of the study area is identified as a component of the TRCA Terrestrial Natural Heritage System including, 'Existing Natural Cover' and 'Potential Natural Cover.' Existing natural cover is identified as four different habitat types: forest, meadow, successional, and wetland.

Potential impacts to these designated natural heritage features are addressed in **Section 5.2** under vegetation removals. These potential impacts will be mitigated through preparation of edge management plans, restoration plans, invasive species management plans and ecological offsets in accordance with TRCA guidelines and policies. These restoration and compensation measures will be determined during detail design in consultation with the City of Vaughan and TRCA. Permits issued by TRCA under O. Reg. 166/06 will be obtained during detail design.

6.0 CONCLUSIONS AND RECOMMENDATIONS

There are several areas that exist in a natural to semi-natural state that will require site-specific environmental management measures. The following tasks shall be carried out in greater detail during future design phases including:

- Preparation of the following environmental management plans: Edge Management Plan; Compensation/Restoration Plans; Erosion and Sediment Control Plan; and, Environmental Inspection and Monitoring Plan;
- Further correspondence shall take place with MECP to discuss permitting requirements for Redside Dace at Purpleville Creek (Crossing 2) and the Tributary of Purpleville Creek (Crossing 3), including preparation of an Information Gathering Form (IGF), Avoidance Alternatives Form (AAF) and an application for an overall benefit permit under Section 17(2)(c) of the ESA;
- Further correspondence shall take place with TRCA to determine application requirements for permits under Ontario Regulation 166/06; and,
- A Request for Review will be submitted to DFO to determine the potential for "harmful alteration of fish habitat" once culvert designs have been advanced at the Tributary of the East Humber River (Crossing 1), Purpleville Creek (Crossing 2) and the Tributary of Purpleville Creek (Crossing 3) as DFO's "measures to protect fish and fish habitat" cannot be fully implemented and there are no 'standards and codes of practices" that apply to culvert replacements.

7.0 REFERENCES

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APPENDIX A
PHOTOGRAPHIC RECORD OF WATERCOURSE CROSSINGS

PROJECT #TA9006
October 2020

PHOTO APPENDIX
Crossing 1

LGL LIMITED
environmental research associates

Upstream facing upstream (east) along north roadside ditch. Ditch enters culvert perpendicularly. Note restoration plantings in background

Upstream (north) end of CSPA culvert under Teston Road. Note staked filter sock across inlet

Facing downstream from upstream end of culvert under Teston Road.

Upstream facing downstream (west) at ditch toward culvert

Facing upstream (north) at watercourse where it comes through valley to roadside ditch. Note wide flat wetland – no channel here

Upstream in flat wetland facing downstream (south) toward road and ditch. No channel – water spread through vegetated area

PROJECT #TA9006
October 2020

PHOTO APPENDIX
Crossing 1

LGL LIMITED
environmental research associates

Downstream end of CSPA culvert facing east

Downstream end of culvert facing upstream (north)

Defined channel downstream of culvert facing downstream (southwest)

Area where defined channel ends and diffuse flow begins through meadow marsh. Facing downstream (south)

Diffused flow through vegetation to small elevation drop into pool. Facing downstream (south)

Pool below first elevation drop. Flow from this pool leads to another pool, followed by a large elevation drop into diffusely-flowing wetland swale. Facing downstream (south)

PROJECT #TA9006
October 2020

PHOTO APPENDIX
Crossing 2

LGL LIMITED
environmental research associates

Upstream channel through cultural meadow upstream (north) of crossing. Facing upstream (north)

Upstream end of culvert at Crossing C2 facing downstream (southeast). Note pool of standing water inside culvert and dry channel upstream

Pool through culvert at Crossing C2 facing downstream (south)

Downstream and of culvert facing downstream (south)

Downstream end of culvert facing upstream (north)

Downstream channel facing downstream (south). Note eroding bank to right

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October 2020

PHOTO APPENDIX
Crossing 2

LGL LIMITED
environmental research associates

Downstream channel facing downstream (south). Note eroding banks and hummocks of grasses and soil

Channel downstream of Crossing C2 just upstream of where it abuts Teston Road slope at 5011 Teston Road. Photo taken from driveway facing upstream (southwest)

Channel downstream of driveway to point where it abuts road slope. Facing downstream (northeast) with Teston Road in upper left

Channel where meander abuts road slope. Facing downstream (east). Teston Road in upper left

Channel facing upstream (southeast) at driveway culvert. Photo taken from top of Teston Road slope.

Facing down the steep Teston Road slope at point where watercourse abuts. Facing south

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PHOTO APPENDIX
Crossing 3

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Facing upstream (north) from upstream end of Teston Road culvert

Upstream end of culvert facing downstream (south). Note obstruction from wooden fencing material

Typical section of channel upstream of Teston Road crossing. Note narrow, shallow flow through dense vegetation

Downstream end of culvert facing downstream (south)

Downstream end of culvert facing upstream (north). Note narrow channel in foreground

Channel downstream of crossing. Note very narrow dimensions through wetland vegetation. Facing downstream (south)

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PHOTO APPENDIX
Crossing 4

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Upstream pond from which water flows originate for the drainage feature crossing at Crossing C4. Facing north from Teston Road east of the crossing

Upstream end of culvert in ditch (adjacent to shrub) with pond in background (behind willow tree). Facing upstream (east) along north ditch of Teston Road

Upstream end of culvert

Swale downstream of culvert (outlet adjacent to cattails in center of photo). Note rip rap associated with a future storm water facility outlet. Facing downstream (west)

Downstream end of culvert facing upstream (north)

Downstream swale facing downstream (west)

APPENDIX B
VASCULAR PLANT LIST

APPENDIX B.
VASCULAR PLANT LIST

	Scientific Name	Common Name	GRank	SRank	MNR	COSEWIC	TRCA	York	MAM	MAS2	FOM	FOD8	FOD7-3	CUW1	CUT1	CUP3-2	CUP3	CUM1-1	Hedgerow
	EQUISETACEAE	**HORSETAIL FAMILY**																	
	Equisetum arvense	field horsetail	G5	S5			L5	X		x			x						
	DRYOPTERIDACEAE	**WOOD FERN FAMILY**																	
	Athyrium filix-femina var. angustum	northern lady fern	G5T5	S5			L5	X					x						
	Matteuccia struthiopteris var. pensylvanica	ostrich fern	G5	S5			L5	X			x		x						
	Onoclea sensibilis	sensitive fern	G5	S5			L5	X					x	x					
	PINACEAE	**PINE FAMILY**																	
*	*Larix decidua*	European larch	G?	SE2			L+										x		
*	*Picea abies*	Norway spruce	G?	SE3			L+				x				x				x
	Picea glauca	white spruce	G5	S5			L3	X			x		x	x		x	x		
*	*Picea pungens*	Colorado spruce	G5	SE1			L+												x
	Pinus resinosa	red pine	G5	S5			L1	R-4								x	x		
	Pinus strobus	eastern white pine	G5	S5			L4	X			x		x	x	x	x	x	x	
*	*Pinus sylvestris*	scotch pine	G?	SE5			L+	X											x
	CUPRESSACEAE	**CEDAR FAMILY**																	
	Juniperus virginiana	eastern red cedar	G5	S5			L5						x						
	Thuja occidentalis	eastern white cedar	G5	S5			L4	X			x		x	x	x		x		x
	RANUNCULACEAE	**BUTTERCUP FAMILY**																	
	Actaea rubra	red baneberry	G5	S5			L5	X					x						
*	*Ranunculus acris*	tall buttercup	G5	SE5			L+	X	x		x		x	x					
	BERBERIDACEAE	**BARBERRY FAMILY**																	
	Podophyllum peltatum	may-apple	G5	S5			L4	X			x								
	ULMACEAE	**ELM FAMILY**																	
	Ulmus americana	white elm	G5?	S5			L5	X			x	x	x	x	x				x
	URTICACEAE	**NETTLE FAMILY**																	
*	*Urtica dioica ssp. dioica*	European stinging nettle	G5T?	SE2			L+	X	x										
	JUGLANDACEAE	**WALNUT FAMILY**																	
	Juglans nigra	black walnut	G5	S4			L5	R-1 Nat			x		x						
	BETULACEAE	**BIRCH FAMILY**																	
	Betula alleghaniensis	yellow birch	G5	S5			L4	X					x						
	Ostrya virginiana	ironwood	G5	S5			L5	X			x								
	CHENOPODIACEAE	**GOOSEFOOT FAMILY**																	
*	*Chenopodium album var. album*	lamb's quarters	G5T5	SE5			L+	X										x	

APPENDIX B.
VASCULAR PLANT LIST

	Scientific Name	Common Name	GRank	SRank	MNR	COSEWIC	TRCA	York	MAM	MAS2	FOM	FOD8	FOD7-3	CUW1	CUT1	CUP3-2	CUP3	CUM1-1	Hedgerow
	POLYGONACEAE	**SMARTWEED FAMILY**																	
*	*Rumex crispus*	curly-leaf dock	G?	SE5			L+	X										x	
	GUTTIFERAE	**ST. JOHN'S-WORT FAMILY**																	
*	*Hypericum perforatum*	common St. John's-wort	G?	SE5			L+	X										x	
	TILIACEAE	**LINDEN FAMILY**																	
	Tilia americana	basswood	G5	S5			L5	X			x	x	x				x		x
	VIOLACEAE	**VIOLET FAMILY**																	
	Viola sororia	woolly blue violet	G5	S5			L5	X					x						
	SALICACEAE	**WILLOW FAMILY**																	
*	*Populus alba*	silver poplar	G5	SE5			L+	X					x		x				
	Populus balsamifera ssp. balsamifera	balsam poplar	G5T?	S5			L5	X				x	x						
	Populus tremuloides	trembling aspen	G5	S5			L5	X				x	x		x		x		
	Salix amygdaloides	peach-leaved willow	G5	S5			L4	X					x						
	Salix bebbiana	long-beaked willow	G5	S5			L4	X		x									
*	*Salix fragilis*	crack willow	G?	SE5			L+	X					x						
*	*Salix X rubens*	reddish willow	HYB	SE4			L+							x					
	BRASSICACEAE	**MUSTARD FAMILY**																	
*	*Alliaria petiolata*	garlic mustard	G5	SE5			L+	X			x		x		x	x	x		
*	*Capsella bursa-pastoris*	shepherd's purse	G?	SE5			L+	X										x	
*	*Hesperis matronalis*	dame's rocket	G4G5	SE5			L+	X				x	x	x					
*	*Thlaspi arvense*	field penny-cress	G?	SE5			L+	X										x	
	GROSSULARIACEAE	**GOOSEBERRY FAMILY**																	
	Ribes hirtellum	smooth gooseberry	G5	S5			L3	X			x	x							
	ROSACEAE	**ROSE FAMILY**																	
*	*Crataegus monogyna*	English hawthorn	G5	SE5			L+	X							x				
	Crataegus punctata	large-fruited thorn	G5	S5			L5	X			x				x				
	Crataegus sp.	hawthorn													x	x		x	x
	Fragaria virginiana ssp. virginiana	scarlet strawberry	G5T?	SU			L5	X			x				x	x			
	Geum aleppicum	yellow avens	G5	S5			L5	X				x	x	x		x	x		
	Geum canadense	white avens	G5	S5			L5	X					x						
*	*Malus pumila*	common apple	G5	SE5			L+	X			x				x			x	x
	Prunus serotina	black cherry	G5	S5			L5	X					x						
	Prunus virginiana var. virginiana	choke cherry	G5T?	S5			L5	X			x	x	x	x		x			x
	Rubus allegheniensis	alleghany blackberry	G5	S5			L5	X						x					

APPENDIX B.
VASCULAR PLANT LIST

	Scientific Name	Common Name	GRank	SRank	MNR	COSEWIC	TRCA	York	MAM	MAS2	FOM	FOD8	FOD7-3	CUW1	CUT1	CUP3-2	CUP3	CUM1-1	Hedgerow
	Rubus idaeus ssp. strigosus	wild red raspberry	G5T	S5			L5	X				x	x	x		x	x		
	FABACEAE	**PEA FAMILY**																	
*	*Lotus corniculatus*	bird's-foot trefoil	G?	SE5			L+	X	x						x			x	
*	*Medicago lupulina*	black medick	G?	SE5			L+	X										x	
*	*Melilotus alba*	white sweet-clover	G?	SE5			L+	X							x			x	
*	*Robinia pseudo-acacia*	black locust	G5	SE5			L+	X					x						
*	*Trifolium hybridum ssp. elegans*	alsike clover		SE5			L+	X										x	
*	*Trifolium pratense*	red clover	G?	SE5			L+	X										x	x
*	*Vicia cracca*	tufted vetch	G?	SE5			L+	X	x									x	
	ELAEAGNACEAE	**OLEASTER FAMILY**																	
*	*Elaeagnus angustifolia*	Russian olive	G?	SE3			L+	X				x							
	LYTHRACEAE	**LOOSESTRIFE FAMILY**																	
*	*Lythrum salicaria*	purple loosestrife	G5	SE5			L+	X	x										
	ONAGRACEAE	**EVENING-PRIMROSE FAMILY**																	
	Circaea lutetiana ssp. canadensis	yellowish enchanter's nightshade	G5T5	S5			L5	X			x	x				x	x		
	CORNACEAE	**DOGWOOD FAMILY**																	
	Cornus alternifolia	alternate-leaved dogwood	G5	S5			L5	X					x						
	Cornus sericea ssp. sericea	red-osier dogwood	G5	S5			L5	X						x			x		
	RHAMNACEAE	**BUCKTHORN FAMILY**																	
*	*Rhamnus cathartica*	common buckthorn	G?	SE5			L+	X			x	x	x	x	x	x	x	x	x
	VITACEAE	**GRAPE FAMILY**																	
	Parthenocissus vitacea	inserted Virginia-creeper	G5	S5			L5	X			x					x			
	Vitis riparia	riverbank grape	G5	S5			L5	X			x	x		x	x	x	x		x
	ACERACEAE	**MAPLE FAMILY**																	
	Acer negundo	manitoba maple	G5	S5			L+?	X				x	x	x	x				x
	Acer saccharum var. saccharum	sugar maple	G5T?	S5			L5	X			x	x	x						x
	ANACARDIACEAE	**SUMAC FAMILY**																	
	Rhus hirta	staghorn sumac	G5	S5			L5	X				x	x	x	x		x	x	x
	Toxicodendron radicans ssp. negundo	poison-ivy	G5T	S5			L4						x						
	GERANIACEAE	**GERANIUM FAMILY**																	
*	*Geranium robertianum*	herb-robert	G5	SE5			L+?	X			x	x				x	x		
	BALSAMINACEAE	**TOUCH-ME-NOT FAMILY**																	
	Impatiens capensis	spotted touch-me-not	G5	S5			L5	X	x	x									
	ARALIACEAE	**GINSENG FAMILY**																	

APPENDIX B.
VASCULAR PLANT LIST

	Scientific Name	Common Name	GRank	SRank	MNR	COSEWIC	TRCA	York	MAM	MAS2	FOM	FOD8	FOD7-3	CUW1	CUT1	CUP3-2	CUP3	CUM1-1	Hedgerow
*	*Hedera helix*	ground ivy	G?	SE1							x								
	APIACEAE	**PARSLEY FAMILY**																	
*	*Aegopodium podagraria*	goutweed	G?	SE5			L+	X			x								
*	*Daucus carota*	wild carrot	G?	SE5			L+	X	x			x	x	x	x		x	x	x
	ASCLEPIADACEAE	**MILKWEED FAMILY**																	
	Asclepias syriaca	common milkweed	G5	S5			L5	X										x	
*	*Cynanchum rossicum*	swallow-wort	G?	SE5			L+	X			x				x			x	
	SOLANACEAE	**POTATO FAMILY**																	
*	*Solanum dulcamara*	bitter nightshade	G?	SE5			L+	X				x	x						
	CONVOLVULACEAE	**MORNING-GLORY FAMILY**																	
*	*Convolvulus arvensis*	field bindweed	G?	SE5			L+												x
	HYDROPHYLLACEAE	**WATER-LEAF FAMILY**																	
	Hydrophyllum virginianum	Virginia water-leaf	G5	S5			L5	X					x						x
	LAMIACEAE	**MINT FAMILY**																	
*	*Leonurus cardiaca ssp. cardiaca*	common motherwort	G?T?	SE5			L+	X										x	
	PLANTAGINACEAE	**PLANTAIN FAMILY**																	
*	*Plantago lanceolata*	ribgrass	G5	SE5			L+	X										x	
*	*Plantago major*	common plantain	G5	SE5			L+	X										x	
	OLEACEAE	**OLIVE FAMILY**																	
	Fraxinus americana	white ash	G5	S5			L5	X			x	x							
	Fraxinus pennsylvanica	red ash	G5	S5			L5	X			x		x	x			x		x
*	*Syringa vulgaris*	common lilac	G?	SE5			L+	X											x
	SCROPHULARIACEAE	**FIGWORT FAMILY**																	
*	*Verbascum thapsus*	common mullein	G?	SE5			L+	X										x	
	CAPRIFOLIACEAE	**HONEYSUCKLE FAMILY**																	
*	*Lonicera tatarica*	tartarian honeysuckle	G?	SE5			L+	X				x	x	x	x	x	x	x	x
	Sambucus nigra ssp. canadensis	common elderberry	G5	S5			L5	X			x								
*	*Viburnum opulus*	guelder rose	G5	SE4			L+	X			x								
	DIPSACACEAE	**TEASEL FAMILY**																	
*	*Dipsacus fullonum ssp. sylvestris*	wild teasel	G?T?	SE5			L+	X										x	
	ASTERACEAE	**ASTER FAMILY**																	
*	*Achillea millefolium var. millefolium*	common yarrow	G5T?	SE?			L+	X										x	
	Ambrosia artemisiifolia	common ragweed	G5	S5			L5	X										x	
*	*Arctium minus*	common burdock	G?T?	SE5			L+								x			x	

APPENDIX B.
VASCULAR PLANT LIST

	Scientific Name	Common Name	GRank	SRank	MNR	COSEWIC	TRCA	York	MAM	MAS2	FOM	FOD8	FOD7-3	CUW1	CUT1	CUP3-2	CUP3	CUM1-1	Hedgerow
	Aster ericoides var. ericoides	white heath aster	G5T?	S5			L5	X										x	
	Aster lanceolatus ssp. lanceolatus	tall white aster	G5T?	S5			L5	X						x				x	
	Aster lateriflorus var. lateriflorus	calico aster	G5T5	S5					x	x			x						
	Aster puniceus var. puniceus	purple-stemmed aster	G5T?	S5			L5	X		x									
	Bidens cernua	stick-tight	G5	S5			L5	X	x										
*	*Cichorium intybus*	chicory	G?	SE5			L+	X										x	
*	*Cirsium arvense*	Canada thistle	G?	SE5			L+	X	x						x		x	x	x
*	*Cirsium vulgare*	bull thistle	G5	SE5			L+	X										x	x
	Echinacea pallida	pale purple coneflower	G4G5	S1															x
	Erigeron philadelphicus var. philadelphicus	Philadelphia fleabane	G5T?	S5			L5	X										x	
	Eupatorium maculatum var. maculatum	spotted joe-pye-weed	G5T5	S5			L5	X	x	x									
	Eupatorium perfoliatum	perfoliate thoroughwort	G5	S5			L4	X		x									
	Eurybia macrophylla	large-leaved aster	G5	S5			L5	X			x								
	Euthamia graminifolia	flat-topped bushy goldenrod	G5	S5										x	x		x	x	
*	*Inula helenium*	elecampane	G?	SE5			L+	X								x			
*	*Leucanthemum vulgare*	ox-eye daisy	G?	SE5			L+	X						x				x	
*	*Matricaria maritima ssp. maritima*	seaside camomile	G5T?	SE?														x	
	Solidago canadensis	canada goldenrod	G5	S5			L5	X	x	x	x	x	x	x	x			x	x
	Solidago canadensis var. scabra	tall goldenrod	G5	S5			L5	X					x			x	x		x
	Solidago gigantea	giant goldenrod	G5	S5			L5	X		x			x					x	
*	*Sonchus arvensis ssp. arvensis*	field sow-thistle	G?T?	SE5			L+	X										x	
	Symphyotrichum cordifolium	heart-leaved aster	G5	S5			L5	X								x	x		
	Symphyotrichum novae-angliae	New England aster	G5	S5			L5	X			x	x	x	x	x		x	x	x
*	*Taraxacum officinale*	common dandelion	G5	SE5			L+	X									x	x	
*	*Tragopogon dubius*	doubtful goat's-beard	G?	SE5			L+	X										x	
*	*Tussilago farfara*	coltsfoot	G?	SE5			L+	X	x	x			x	x				x	x
	ARACEAE	**ARUM FAMILY**																	
	Arisaema triphyllum ssp. triphyllum	small jack-in-the-pulpit	G5T5	S5			L4	X			x								
	LEMNACEAE	**DUCKWEED FAMILY**																	
	Lemna minor	lesser duckweed	G5	S5			L5	X		x									
	JUNCACEAE	**RUSH FAMILY**																	
	Juncus effusus ssp. solutus	soft rush	G5T?	S5			L4	X		x									

APPENDIX B.
VASCULAR PLANT LIST

	Scientific Name	Common Name	GRank	SRank	MNR	COSEWIC	TRCA	York	MAM	MAS2	FOM	FOD8	FOD7-3	CUW1	CUT1	CUP3-2	CUP3	CUM1-1	Hedgerow
	Juncus tenuis	path rush	G5	S5			L5	X	x										
	CYPERACEAE	**SEDGE FAMILY**																	
	Carex bebbii	Bebb's sedge	G5	S5			L5	X		x									
	Carex rosea	stellate sedge	G5	S5			L5	X					x						
	Carex stipata	awl-fruited sedge	G5	S5			L5	X	x	x									
	Carex stricta	tussock sedge	G5	S5			L4	X		x									
	Schoenoplectus tabernaemontani	American great bulrush	G?	S5			L4	X		x									
	Scirpus microcarpus	small-fruited bulrush	G5	S5			L4	X		x									
	POACEAE	**GRASS FAMILY**																	
*	*Bromus inermis ssp. inermis*	awnless brome	G4G5T?	SE5			L+	X			x			x	x	x	x	x	x
*	*Dactylis glomerata*	orchard grass	G?	SE5			L+	X					x	x	x		x	x	
*	*Digitaria sanguinalis*	large crabgrass	G5	SE5			L+	X										x	
*	*Elymus repens*	quack grass	G?	SE5			L+	X										x	
	Panicum capillare	witch grass	G5	S5			L5	X										x	
	Phalaris arundinacea	reed canary grass	G5	S5			L+?	X	x	x		x			x				
*	*Phleum pratense*	timothy	G?	SE5			L+	X										x	
	Phragmites australis	common reed	G5	S5			L+?	X	x					x				x	x
	Poa pratensis ssp. pratensis	Kentucky bluegrass	G5T	S5			L+	X	x		x			x	x	x	x	x	x
*	*Setaria viridis*	green foxtail	G?	SE5			L+	X										x	
	TYPHACEAE	**CATTAIL FAMILY**																	
	Typha angustifolia	narrow-leaved cattail	G5	S5			L+	X		x									
	Typha latifolia	broad-leaved cattail	G5	S5			L4	X	x	x				x					
	LILIACEAE	**LILY FAMILY**																	
	Erythronium americanum ssp. americanum	yellow dog's-tooth violet	G5T5	S5			L5	X			x								
	Maianthemum canadense	wild lily-of-the-valley	G5	S5			L4	X					x						
	ORCHIDACEAE	**ORCHID FAMILY**																	
*	*Epipactis helleborine*	common helleborine	G?	SE5			L+	X			x								

*Non-native species
X present
Refer to **Appendix C** for species rank definitions.

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 that 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 *Endangered Species Act*.
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
CORRESPONDENCE WITH REGULATORY AGENCIES

Toronto and Region Conservation Authority

September 3, 2021 CFN 62211

BY E-MAIL ONLY (mani.shahrokni@vaughan.ca)

Mr. Mani Shahrokni
The City of Vaughan
2141 Major Mackenzie Drive,
Vaughan, Ontario
L6A 1T1

Dear Mr. Shahrokni:

Re: Natural Heritage Report- Existing Conditions
Teston Road Improvements, from 250 meters West Pine Valley Drive to Kleinburg Way Summit
Municipal Class Environmental Assessment – Schedule C
Humber River Watershed; City of Vaughan; Regional Municipality of York

Toronto and Region Conservation Authority (TRCA) staff received the following documents for our review in support of the above noted Environmental Assessment Study.

- Natural Heritage Report-Existing Conditions Teston Road from 250-meter West of Pine Valley Drive to Kleinburg Summit Way; prepared by LGL Limited, Dated October 2020; received by TRCA on August 12, 2021

Staff has completed review of the above noted documents and detailed comments are provided in appendix A.

PROJECT OVERVIEW

It is our understanding that this undertaking involves the review of the transportation needs, safety and operational improvements for all modes of transportation including biking and walking for 2.33 km of Teston Road from 250 m west of Pine Valley Drive in the east to Kleinburg Summit Way in the west. The Study shall be conducted in accordance with the Municipal Engineers Association's Municipal Class Environmental Assessment process (MCEA, October 2000, as amended in 2007, 2011 and 2015), Schedule B.

Should you have any questions or require any additional information please contact me at extension 5715 or at Manirul.islam@trca.ca

Regards,

Manirul Islam
Planner, Infrastructure Planning and Permits

Development and Engineering Services
/MI

Attached: Appendix A

APPENDIX A: TRCA COMMENTS AND PROPONENT RESPONSES

ITEM	TRCA COMMENTS September 3, 2021	PROPONENT/CONSULTANT RESPONSE
Ecology Comments:		
1.	The Natural Heritage Report provided a good job of documenting the natural features within the area. However, potential ecological impacts from the proposed works and how these impacts will be avoided, minimized, mitigated, and compensated for has not been included within the report. Please update the report accordingly. Please also include a discussion in the NHE of how any potential changes to the crossing structures will be done so in accordance with the TRCA Crossing Guideline. Staff look forward for a complete and comprehensive submission which will include response to above comments.	
Water Resources Comments:		
2.	No comments on Natural Heritage Report. Staff forward to the comments on previous submissions being addressed in subsequent stages of the project.	