



Technical Memorandum – Aquatic Habitat Assessment

Date: February 23, 2021 **Project No.:** 300051839.0000

Project Name: Patterson Side Road and Duffy's Lane Bridges

Client Name: Town of Caledon

Submitted To: File

Submitted By: Matthew Moote, H.B.Sc., C.Tech., CAN-CISEC-IT, Aquatic Ecologist

Reviewed By: Chris Pfohl, CET, EP, CAN-CISEC, Sr. Aquatic Ecologist

1.0 Project Background

R.J. Burnside & Associates Limited (herein, Burnside) has been retained by the Town of Caledon to provide engineering, design, consulting and permitting services required for the replacement of multiple bridges and culverts. Three of these structures, Patterson Side Road Bridge 1 and 2 (herein, PSR-1 and PSR-2) and the Duffy's Lane Bridge (DLB) are included as part of a Schedule B Environmental Assessment.

PSR-1 is located approximately 160m southwest of Duffy's Lane. PSR-2 is located approximately 15 m northeast of Duffy's Lane. The Duffy's Lane bridge is located approximately 45 m southeast of Patterson Side Road.

A component of the EA includes the characterization of the natural environment within the Study Area to evaluate the alternative solutions including 1) do nothing; 2) abandon the structure and close the road; 3) rehabilitate the structure; and 4) replace the structure. The characterization of the aquatic habitat to support the evaluation of alternatives is included herein.

The federal *Fisheries Act* prohibits causing Harmful Alteration, Disruption, and Destruction (HADD) of fish habitat, as well as the Death of Fish by means other than fishing. This memo describes the historical and existing fish habitat condition, and recommendations for mitigation

that should be employed in the construction of the preferred design alternative if in-water works are required.

2.0 Project Description

PSR-1 consists of a 7.0 m (+/-) span (7.4 m +/- parallel to road) cast-in-place concrete rigid frame with an overall structure width of approximately 7.4 m (+/-) and a driving platform width of approximately 6.4 m. The structure is skewed at an angle of approximately 18.4° to perpendicular.

PSR-2 consists of a 13.7 m (+/-) span cast-in-place concrete rigid frame with an overall structure width of approximately 8.7 m (+/-) and a driving platform width of approximately 7.67 m.

The Duffy's Lane Bridge is an 8.8m wide, 9.14 m span cast-in-place concrete rigid frame arched soffit.

3.0 Aquatic Habitat Assessment

3.1 Background Information Review

Burnside Aquatic Ecology staff reviewed the following sources of information to evaluate the historical background conditions:

- Aerial Imagery;
- Ministry of Natural Resources and Forestry (MNR) Aquatic Resources Area (ARA) mapping (2017);
- Department of Fisheries and Oceans (DFO) Species at Risk (SAR) mapping (2020);
- Natural Heritage Information Centre (NHIC) mapping (2020); and

The MNR ARA data does not display that the watercourses flow through structures PSR-1 or DLB, however based on field observations the watercourse flows from PSR-1 to DLB and discharges downstream of PSR-2. The watercourse that flows through PSR-2 is known as the Humber River. The watercourse that flows through PSR-1 and DLB is an unnamed tributary of the Humber River. The species of fish historically observed in the Humber River are listed below in Table 1. These fish could inhabit the Tributary of the Humber as well.

Table 1. Fish Species Historically Observed in the Humber River

Species Name	Scientific Name	Thermal Regime Preference
American brook lamprey	<i>Lethenteron appendix</i>	Cold
Blackchin shiner	<i>Notropis heterodon</i>	Cool
Blacknose dace	<i>Rhinichthys spp.</i>	Cool

Species Name	Scientific Name	Thermal Regime Preference
Bluntnose minnow	<i>Pimephales notatus</i>	Warm
Brassy minnow	<i>Hybognathus hankinsoni</i>	Cool
Brook trout	<i>Salvelinus fontinalis</i>	Cold
Brown bullhead	<i>Ameiurus nebulosus</i>	Warm
Brown trout	<i>Salmo trutta</i>	Cold
Common shiner	<i>Luxilus cornutus</i>	Cool
Creek chub	<i>Semotilus atromaculatus</i>	Cool
Fantail darter	<i>Etheostoma flabellare</i>	Cool
Fathead minnow	<i>Pimephales promelas</i>	Warm
Johnny darter	<i>Etheostoma nigrum</i>	Cool
Largemouth bass	<i>Micropterus salmoides</i>	Warm
Longnose dace	<i>Rhinichthys cataractae</i>	Cool
Mottled sculpin	<i>Cottus bairdii</i>	Cold
Northern hog sucker	<i>Hypentelium nigricans</i>	Warm
Northern redbelly dace	<i>Chrosomus eos</i>	Cool
Pumpkinseed	<i>Lepomis gibbosus</i>	Warm
Rainbow darter	<i>Etheostoma caeruleum</i>	Cool
Redside dace	<i>Clinostomus elongatus</i>	Cool
River chub	<i>Nocomis micropogon</i>	Cool
Rock bass	<i>Ambloplites rupestris</i>	Cool
Slimy sculpin	<i>Cottus cognatus</i>	Cold
Stonecat	<i>Noturus flavus</i>	Warm
White sucker	<i>Catostomus commersonii</i>	cool

The DFO SAR and NHIC mapping do not state that aquatic SAR inhabit the watercourse in the vicinity of the three structures discussed in this memo. While the ARA data states that Redside dace (listed as Endangered) inhabit the watercourse, the DFO and NHIC mapping does not illustrate this occurrence. The potential presence of Redside dace could be from data downstream of the Study Area.

3.2 Existing Conditions

Burnside's Aquatic Ecologist visited the sites on October 30, 2020 to observe conditions with respect to form, function and fish habitat. The weather conditions during the site visit were overcast and -1°C. the water clarity was very clear at the 3 structures as the substrate was visible.

Channel measurements and conditions are provided in Table 2 below. Additional information regarding the aquatic habitat conditions observed are presented in Sections 3.2.1 to 3.2.3 below.

Table 2. Channel Characteristic of the Watercourses that Flow through PSR-1 and 2 and DLB

Structure	Wetted Width / Depth (m)	Bankfull Width / Depth (m)	Substrate	Bank Stability
PSR-1 Upstream	5.0 / 0.2	7.0 / 1.8	Sand, gravel, cobble, trace boulders	Moderate erosion observed.
PSR-1 Downstream	5.0 / 0.3	6.5 / 1.2	Sand, gravel, cobble	Moderate erosion observed
PSR-2 Upstream	8.5 / 0.2	11 / 1.1	Sand, gravel cobble, trace boulders	Minor erosion observed
PSR-2 Downstream	8.8 / 0.4	9 / 1.2	Sand, gravel cobble, trace boulders	Minor erosion observed
DLB Upstream	3.5 / 0.25	3.8 / 0.75	Cobble, sand, gravel	Moderate erosion observed
DLB Downstream	3.4 / 0.35	3.4 / 0.8 m	Cobble, sand, gravel	Minor erosion observed

3.3 Patterson Side Road 1

3.3.1 Upstream

Upstream of PSR-1 the watercourse flows through densely forested lands in a northwest to southeast direction (Photo 1). The morphology of the upstream reach is comprised primarily of runs with sections of flats present as well. The vegetation on the banks is comprised primarily of *White Cedars (Thuja occidentalis)* with grasses and forbs observed as well. Moderate erosion was observed with some scalloped/undercut conditions (Photo 2) and tree roots exposed.

Large woody debris, both in-stream and overhanging, is present and provides cover and habitat for aquatic life in the watercourse. The vegetation on the banks, as well as the woody debris, shades a significant portion of the reach upstream of PSR-1. Through the bridge the streambed has scoured and is slightly deeper (0.75 m) (Photo 3).



Photo 1: Facing south, the watercourse reach upstream of PSR-1 (10-30-2020).



Photo 2: Facing north, an undercut section of the bank with large woody debris within it (10-30-2020).



Photo 3: Facing north, the watercourse and scoured steambed at the inlet of PSR-1 (10-30-2020)

3.3.2 Downstream

Downstream of PSR-1 the watercourse flows through another section of forested lands (Photo 1). The watercourse bends approximately 15 m downstream of PSR-1 to flow in a west to east direction in a meandering channel. The vegetation is mostly comprised of White cedars through this section, with grasses and forbs present as well. The watercourse flows primarily in a flats type of morphology with runs present as well. A debris jam formed from fallen trees and woody debris was observed approximately 10 m downstream of PSR-1 (Photo 5). This represents a potential barrier to fish movement during periods of low-flow.

Sections of bank material have sloughed and minor undercutting was observed as well. Woody debris is abundant in the reach downstream of PSR-1. Organic materials in the form of fallen leaves were observed throughout the downstream reach as well. Veronica (*Veronica anagallis-aquatica*) was observed downstream of the bridge.

Fish were not observed upstream or downstream of PSR-1, although it is considered fish habitat under the *Fisheries Act*.



Photo 4: Facing south, the watercourse downstream of PSR-1 (10-30-2020).



Photo 5: Facing south, a section of the debris jam downstream of PSR-1 (10-30-2020)

3.4 Patterson Side Road 2

3.4.1 Upstream

Upstream of PSR-2 the watercourse flows from north to south in a wide, gently meandering channel (Photos 6 and 7). It flows through forested lands, vegetated with White cedars. The

banks of the upstream reach are stable upstream of the bridge with limited erosion observed. The morphology of the upstream reach is composed primarily of runs and flats.

Approximately 10 m upstream of PSR-2 the cedars are present in a higher density than they are closer to the structure. In this section the cedars overhang and shade close to the entire surface area of the watercourse. Some trace boulders are present downstream of the cedars. The area where the cedars are located lacks diversity in substrate and wetted depth.

Through the bridge there is an exposed bank against the east abutment. Large boulders are present against the other abutment (Photo 8).



Photo 6: Facing north, the watercourse upstream of PSR-2 (10-30-2020).



Photo 7: Facing south, the watercourse flowing toward PSR-2 (10-30-2020).



Photo 8: Facing north, the watercourse flowing through the PSR-2 bridge (10-30-2020).

3.4.2 Downstream

Downstream of PSR-2 the watercourse flows in a gently meandering pattern from north to south (Photo 9). Roadside ditches enter the watercourse from both banks. The right upstream (east) bank is densely vegetated with White cedars and grasses. The left upstream bank is vegetated with cedars as well, although with more grasses and shrubs. A single riffle is present at the

outlet of the bridge and downstream flows in a combination of runs and flats. The vegetation does not overhang a significant amount of the downstream reach, and it shaded approximately 50% of the surface area of the watercourse.

Minor undercutting of the banks was observed, and they are slightly eroded. Watercress (*Nasturtium officinale*) was observed near the outlet of the watercourse that flows through the PSR-1 bridge and DLB (Photo 10).

Fish were not observed upstream or downstream of PSR-2, although a dead Brown trout was observed at the outlet of the channel from DLB.



Photo 9: Facing south, the watercourse downstream of PSR-2 (10-30-2020).



Photo 10: Facing north, watercress observed downstream of PSR-2 (10-30-2020).

3.5 Duffy's Lane Bridge

3.5.1 Upstream

The watercourse flows from PSR-1 to DLB. The upstream reach flows from west to east through lands that are densely forested with cedars. There is an abundance of large woody debris overhanging and in-stream upstream of DLB (Photo 11). The vegetation on the banks shades the majority of the watercourse and the overhanging and in-stream woody debris provides overhead cover for aquatic life (fish, crayfish etc.).

The watercourse flows in a runs type of morphology upstream of the bridge. The banks are more eroded closer to DLB than they are downstream of PSR-1, and slightly undercut.

Within DLB there are broken vertical wooden supports and a trace amount of boulders in the bridge (Photo 12). Against the south abutment the sediment is exposed, and the flow of the watercourse is closer to the northern abutment.



Photo 11: Facing west, the watercourse upstream of DLB (10-30-2020).



Photo 13: Facing north, the watercourse through DLB (10-30-2020).

3.5.2 Downstream

Downstream of DLB the watercourse flows for approximately 4.5m prior to discharging to the Humber River that is conveyed through PSR-2 (Photo 13). The short length of the channel flows in a flats type of morphology prior to discharging to the section of Humber River which is discussed above in Section 3.4.2 of this memo (Photo 14).

Fish were not observed upstream or downstream of DLB.



Photo 13: Facing east, the channel downstream of DLB prior to discharging to the Humber River (10-30-2020).



Photo 14: Facing south, the Humber River downstream of where the watercourse that flows through DLB discharges (10-30-2020).

3.6 Fish Habitat

Fish were not observed during the October 30th, 2020 site visit although will be present in and around all structures. The *Fisheries Act* defines fish habitat as water frequented by fish and any other areas on which fish depend directly or indirectly to carry out their life processes, including spawning grounds and nursery, rearing, food supply and migration areas. The watercourses in the vicinity of all bridges would be capable of providing habitat for species of fish to carry out these life processes. As such, HADD and the Death of Fish must be mitigated in the design and construction of any proposed design alternative.

The MNRF ARA mapping states that Redside dace, a species classified as Endangered by the provincial Endangered Species Act and the federal Species at Risk Act, has historically been observed in the watercourse. The DFO SAR and the provincial NHIC mapping do not state that this species has been observed in the Study Area or in the vicinity of it. Suitable habitat for this species, including small streams and headwaters with overhanging grasses and vegetation, were not observed in the Study Area.

4.0 Impacts and Mitigation

Under the federal *Fisheries Act* it is prohibited to cause Harmful Alteration, Disruption or Destruction (HADD) of fish habitat as well as the Death of Fish by means other than fishing. At this stage the timing window for in-water works in the Study Area is July 15th to September 30th. At the detailed design phase of the project the timing window for in-water works should be confirmed with the MNRF.

Work zone isolation should be performed if in-water works (i.e. structure replacement) are required for the construction of the preferred design alternative. Cofferdams constructed of clean, non-erodible materials should be constructed upstream and downstream of the works area to isolate it. Flows should be maintained downstream through pumping or a by-pass culvert and the isolated work area should be dewatered. All pump intakes must be screened to prevent the entrainment or impingement of fish.

If repairs to the structure are the preferred design alternative, then a debris platform may need to be installed to ensure deleterious substances (i.e. concrete) do not enter the watercourse.

If in-water works and work zone isolation are required, then the Death of Fish must be mitigated by performing a fish salvage prior to the commencement of in-water works under a License to Collect Fish (LCF) obtained from the Guelph District MNRF. If any flow events result in overtopping of the cofferdams subsequent fish salvages will be performed to ensure fish are not killed.

Erosion and sediment controls (ESC) should be installed throughout the work areas to prevent sedimentation of the watercourse or other sensitive features present. Inspection of the ESC

measures is recommended during construction to ensure that they protect the watercourse and sensitive work areas.

Post-construction, the disturbed area of the watercourse should be restored with a mix of suitably sized round stone and native substrate placed through the culvert and at the inlet and outlet. The embankments disturbed above the annual highwater mark should be restored with erosion control blankets, topsoil and seeding, and plantings where appropriate. The slopes and disturbed area adjacent to the watercourse should be restored with rip-rap above the annual high-water mark. Angular stone is not to be placed below the annual high-water mark.

5.0 Conclusion

The watercourses are considered fish habitat as defined under the Federal *Fisheries Act*. As such the mitigation measures described in Section 4.0 of this memo should be implemented if in-water works are required for the preferred design alternative to ensure that HADD and the Death of Fish does not occur.

R.J. Burnside & Associates Limited



Matthew Moote, H.B.Sc., C.Tech., CAN-CISEC-IT,
Aquatic Ecologist

MM:js

Enclosure(s) Figure 1. Aquatic Conditions

cc: Deanna De Forest, B.Sc. EP, Senior Environmental Coordinator, R.J. Burnside & Associates Limited

Matt Brooks, P.Eng., Bridge Group Leader, R.J. Burnside & Associates, R.J. burnside & Associates Limited

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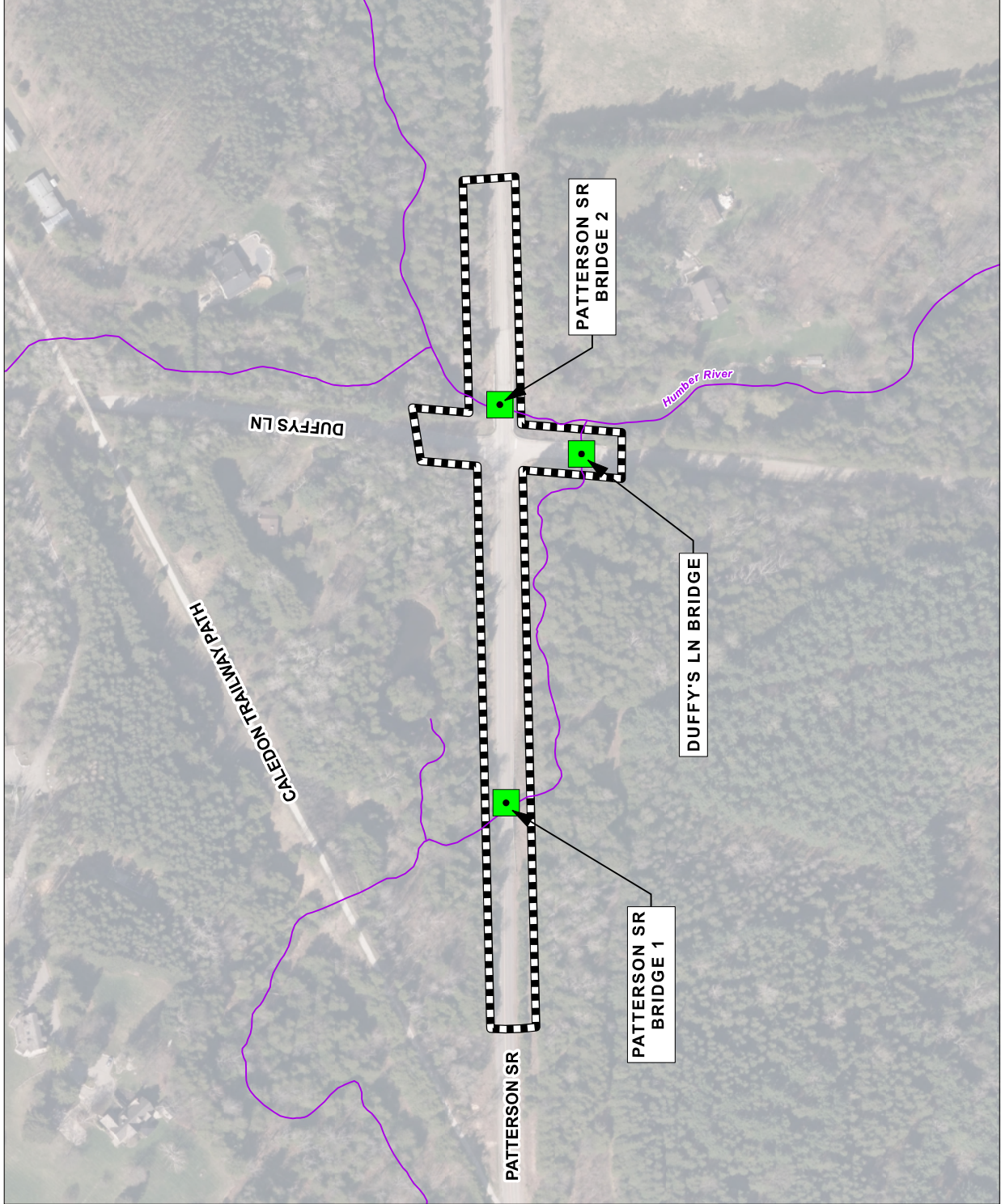
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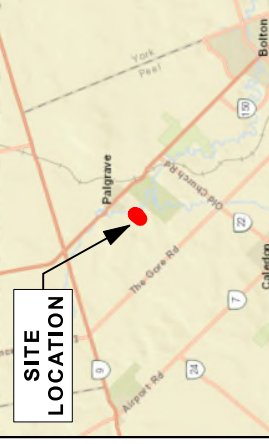
51839_Patterson and Duffy's Lane Bridge Memo
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Bridge Location

Watercourse (Cold)

Study Area



Sources:

1. Ministry of Natural Resources and Forestry © Queen's Printer for Ontario.
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Coord. System: NAD 1983 CSRS UTM Zone 17N

Projection: Transverse Mercator

Central Meridian: 81°00.000'

False Easting: 500,000m

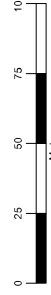
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Page Orientation: 308.54°

Scale Factor: 0.99960



Grid North



BURNSIDE

Client

TOWN OF CALEDON

Figure Title

**PATTERSON SIDEROAD
CALEDON BRIDGES
AQUATIC CONDITIONS**

Drawn	Checked	Date	Figure No.
MD	MM	2021/02/02	1
Scale	Project No.		
H 1:1,750			300051839



Technical Memorandum - Terrestrial Assessment

Date: February 1, 2024 **Project No.:** 300051839.0000

Project Name: Natural Heritage Memo - Patterson Side Road Bridges 1 and 2, Duffy's Bridge

Client Name: Town of Caledon

Submitted To: File

Submitted By: Devin Soeting, C.E.T., EP, CAN-CISEC

Reviewed By: Deanna De Forest, B.Sc., E.P., and Kevin Butt, B.Sc. (Env)., Eco. Rest. Cert.

R.J. Burnside & Associates Limited (Burnside) was retained by the Town of Caledon (Town) to complete a Schedule B Municipal Class Environmental Assessment (MCEA) to consider improvements to Patterson Side Road Bridges 1 and 2, and Duffy's Lane Bridge, as a result of increased wear and tear on existing infrastructure through increased traffic use.

A component of the MCEA includes the characterization of the natural environment within the Study Area to evaluate alternative solutions, including 1) do nothing; 2) abandon the structure and close the road; 3) rehabilitate the structure; and 4) replace the structure. The characterization of the terrestrial natural environment is included herein.

Aquatic habitat within the Study Area is addressed in the Burnside Patterson Side Road Bridges 1 and 2 and Duffy's Lane Bridge Environmental Assessment – Aquatic Assessment Technical Memo.

1.0 Study Area

For the purposes of this technical memorandum, the Study Area is defined as the Patterson Side Road Bridges 1 and 2, Duffy's Lane Bridge, the associated road corridor between the bridges, and extending approximately 100 m beyond the bridges, as well as the vegetated riparian corridor located approximately 20 m upstream and downstream of the bridges (refer to enclosed Figure 1). Patterson Side Road Bridge 1 (B22162016) is located approximately 0.150 km west of Duffy's Lane over an unnamed tributary of the Humber River. Duffy's Lane Bridge (B22068009) is located approximately 0.03 km south of Patterson Side Road over the tributary of the Humber River. Patterson Side Road Bridge 2 (B22164017) is located approximately 0.02 km east of Duffy's Lane over the Humber River. In the greater area, beyond the study area, adjacent lands include rural residential properties and natural forest and wetland

communities. The Caledon Trail known as the K-Tea Cup Single Track Bike Trail is located to the west of the Study Area. The Albion Hills Conservation Area is to the southwest of the Study Area.

2.0 Methodology

A review of existing data was conducted to obtain secondary source information relating to the Study Area. Sources reviewed included:

- Aerial photography;
- Toronto Region Conservation Authority (TRCA) Ecological Land Classification (ELC) Mapping;
- Natural Heritage GIS Data Layers from Land Information Ontario (LIO);
- Ontario Breeding Bird Atlas (OBBA) (Square 17NJ96);
- Ontario Reptile and Amphibian Atlas (ORAA) (Square 17NJ96);
- Ministry of Natural Resources and Forestry (MNR) Aquatic Resources Area mapping; and
- MNR Natural Heritage Information Centre (NHIC) Online Map Viewer / Database (Square 17NJ9365).

Burnside completed a field assessment within the Study Area of Patterson Bridge 1 and 2 on September 30, 2020, and Duffy's Lane Bridge on October 23, 2020, from publicly accessible locations to characterize vegetation communities according to the Ecological Land Classification (ELC) System for Southern Ontario, First Approximations (Lee *et al.*, 1998), updated 2010¹. TRCA ELC community mapping was referenced and verified in the field. The field assessment included the assessment of the potential for the habitat of Species at Risk (SAR), including breeding bird, bat, amphibian and reptile habitat, and incidental wildlife observations.

3.0 Vegetation Communities

Within the Study Area, lands are comprised of riparian vegetation associated with Humber River and its tributary, as well as open aquatic and treed vegetation communities. A total of eight vegetation communities were identified in the Study Area as follows:

- Fresh-Moist Deciduous Woodland (WODM5);
- White Cedar Hardwood Organic Mixed Swamp (SWMO1);
- Fresh Moist White Cedar Hardwood Mixed Forest (FOMM7-2);
- White Cedar Conifer Organic Coniferous Swamp (SWCM1-2);
- Dry Fresh White Cedar Poplar Mixed Forest (FOMM4-2);
- White Cedar Mineral Coniferous Swamp (SWCM1);
- Fresh-Moist White Cedar Coniferous Forest (FOCM4-1); and
- Open Aquatic (OAO).

¹ Lee, H.T., et al. (1998). Ecological Land Classification for Southern Ontario: First Approximation and Its Application. Ontario Ministry of Natural Resources, Southcentral Science Section, Science Development and Transfer Branch. SCSS Field Guide FG-02.

These communities are described below and are illustrated in Figure 1. All of the communities identified are considered to be relatively common in Ontario. Sensitive vegetation communities or provincially significant plant species were not observed within the Study Area during the field assessment.

3.1 Fresh Moist Deciduous Woodland (WODM5)

Photo 1: WODM5 Community - As viewed from Patterson Side Road looking northeast (September 20, 2020)



The community is a woodland community with tree cover of less than 60%. Deciduous tree cover comprises 75% of the canopy and is dominated by native deciduous trees, including Paper Birch (*Betula papyrifera*), Trembling Aspen (*Populus tremuloides*), and some Red Maple (*Acer rubrum*) trees with a subcanopy including Virginia Chokecherry (*Prunus virginiana*), Black Walnut (*Juglans nigra*), and White Cedar (*Thuja occidentalis*). Understorey was dominated by White Cedar and limited groundcover noted included Canada Goldenrod (*Solidago canadensis*), Queen Anne's Lace (*Daucus carota*) and Coltsfoot (*Tussilago farfara*).

3.2 White Cedar Hardwood Organic Mixed Swamp (SWMO1)

Photo 2: SWMO1 Community - As seen looking northwest from Patterson Side Road towards Duffy's Lane (September 30, 2020)



This community is dominated by both coniferous and deciduous trees, including White Cedar coniferous trees and Paper Birch deciduous trees. Trees that were occasional in the canopy, included Balsam Fir (*Abies balsamea*), Red Maple, and Trembling Aspen. Understorey trees, included Green Ash (*Fraxinus pennsylvanica*), Red-Osier Dogwood (*Cornus sericea*) and non-native vegetation including Manitoba Maple (*Acer negundo*), Common Buckthorn (*Rhamnus cathartica*) and River-bank Grape (*Vitis riparia*) were noted. Groundcover included water tolerant plants including Sensitive Fern (*Onoclea sensibilis*), Spotted Jewelweed (*Impatiens capensis*), Canada Anemone (*Anemone canadensis*), Spinulose Wood Fern (*Dryopteris carthusiana*), White Snakeroot (*Ageratina altissima*), Wood Nettle (*Laportea canadensis*), Canada Goldenrod (*Solidago canadensis*), Common Beggar-ticks (*Bidens frondosa*), Spotted Joe Pye Wweed (*Eutrochium maculatum*), Common Boneset (*Eupatorium perfoliatum*), Willow-Herb (*Epilobium ciliatum*), and Bull Thistle (*Cirsium vulgare*), Bittersweet Nightshade (*Solanum dulcamara*), Moss sp, and Common Milkweed (*Asclepias syriaca*). Snags were noted in this community.

3.3 Fresh Moist White Cedar Hardwood Mixed Forest (FOMM7-2)

Photo 3: FOMM7-2 Community - As seen looking northeast from Patterson Side Road towards Duffy's Lane (September 30, 2020)



This community is co-dominated by coniferous and deciduous trees including White Cedar coniferous trees and Trembling Aspen deciduous trees. Trees that were occasional in the canopy included White Pine (*Pinus strobus*). Understory included Green Ash trees with non-native River-bank Grape and Tartarian Honeysuckle (*Lonicera tatarica*). Groundcover included water tolerant plants including Spinulose Woodfern, New England Aster (*Symphotrichum novae-angliae*), and Canada Goldenrod. Snags were noted in this community.

3.4 White Cedar Conifer Organic Coniferous Swamp (SWCM1-2)

Photo 4: SWCM1-2 Community - As viewed from Patterson Side Road and Duffy's Lane Intersection looking northeast (September 30, 2020)



This community is dominated by White Cedar coniferous trees from canopy to understorey. Groundcover included water tolerant plants including Spinulose Wood Fern, New England Aster, and Canada Goldenrod. Snags were noted in this community.

3.5 Fresh White Cedar Poplar Mixed Forest (FOMM4-2)

Photo 5: FOMM4-2 - As viewed from Duffy's Lane Bridge looking southeast (September 30, 2020)



The community is comprised of both coniferous and deciduous trees. White Cedar trees dominate the canopy of this community type. Trembling Aspen trees dominate the deciduous portion of the canopy with American Basswood (*Tilia americana*), Manitoba Maple, and Black Walnut trees noted. The understorey layer consisted of vegetation typically found in disturbed areas such as Tartarian Honeysuckle, River-bank Grape and Virginia Chokecherry. Groundcover included, Calico Aster (*Symphotrichum lateriflorum*), Grass-leaved Goldenrod (*Euthamia graminifolia*), and Common Milkweed.

3.6 White Cedar Mineral Coniferous Swamp (SWCM1)

Photo 6: SWCM1 - As viewed from Duffy's Lane Bridge looking southwest (October 23, 2020)



This community is dominated by White Cedar coniferous trees with some Yellow Birch (*Betula alleghaniensis*) and White Pine trees in the canopy. The subcanopy included Black Walnut and Manitoba Maple. The understorey and groundcover included both water tolerant species and introduced species indicative of disturbance. The understorey included water tolerant Red-Osier Dogwood, and Speckled Alder (*Alnus incana*) with non-native and invasive Common Buckthorn. Groundcover included water tolerant potted Joe Pye Wweed, Cat-tails (*Typha x glauca*), Bittersweet Nightshade, Sensitive Fern, Bottlebrush Sedge (*Carex hystercina*), and Spotted Jewelweed, with species typical of disturbed sites Common Horsetail (*Equisetum arvense*), Yarrow (*Achillea millefolium*) and non-native species Common Soapwort (*Saponaria officinalis*).

3.7 Fresh-Moist White Cedar Coniferous Forest (FOCM4-1)

Photo 7: FOCM4-1 - As viewed looking east from the north side of Patterson Side Road Bridge 1 looking toward Duffy's Lane / Bridge 2 (September 30, 2020)



Photo 8: FOCM4-1 - As viewed looking west along the south side of Patterson Side Road looking towards Bridge 1 (September 30, 2020)



The community is dominated by White Cedar trees in the canopy with some White Pine trees. The understory layer consists of Red-Osier Dogwood and vegetation typically found in disturbed areas such as American Basswood, Common Buckthorn, and Manitoba Maple. Also, found in the understory were some Autumn Olive (*Elaeagnus umbellata*), highly invasive shrub species. Partial vegetation clearing for hydro lines was observed on the south side of Patterson Side Road, parallel to the tributary of Humber River.

Disturbed groundcover included patches of Canada Yew (*Taxus canadensis*), spreading Virginia Clematis (*Clematis virginiana*) and introduced vegetation including European Lily-of-the-Valley (*Convallaria majalis*). Watercourse flooding related groundcover included Calico Aster, Purple Stemmed Aster (*Symphyotrichum puniceum*), White Heath Aster (*Symphyotrichum ericoides*), New England Aster, Ostrich Fern (*Matteuccia struthiopteris*), Tall Goldenrod (*Solidago altissima*), Heart-leaved Willow (*Salix cordata*), Canada Anemone (*Anemonastrum canadense*), and Spotted Joe Pye weed.

3.8 Open Aquatic (OAO)

Photo 9: OAO as seen looking south downstream in Coldwater Creek, south of Patterson Bridge 2 and east of Duffy's Lane Bridge (September 30, 2020)



Photo 10: As viewed from Duffy's Lane Bridge looking southeast (September 30, 2020)



Photo 11: OAO as seen looking south downstream in Coldwater Creek, north of Patterson Bridge 2 (September 30, 2020)



Photo 12: OAO as seen looking southeast from Patterson Bridge 1 (September 30, 2020)



The OAO areas are generally abundant in overhanging vegetation. They are all shallow with sandy bottoms, occasional boulders were noted with some emergent vegetation consisting of *Watercress* (*Nasturtium officinale*). Water tolerant plant species associated with the presence of watercourses were observed adjacent to the watercourses and described in their respective communities.

4.0 Wildlife and Habitat Observations

Wildlife species observed during the field assessment included a foraging female Eastern Downy Woodpecker (*Picoides pubescens*) and Eastern Grey Squirrels (*Sciurus carolinensis*) in FOCM4-1. Evidence of other wildlife observed in the Study Area included excavated holes in trees in SWCM1-2, Canadian Beaver (*Castor canadensis*) chewed tree trunks on banks of OAO south of Duffy's Lane Bridge, Raccoon (*Procyon lotor*) tracks under Patterson Bridge 2, North American Porcupine (*Erethizon dorsatum*) stripped tree bark in SWMO1, Organ Pipe Mud Dauber (*Trypoxylon politum*) nests on Patterson Bridge 2, holes from a sapsucker (*Sphyrapicus sp.*) avian species in SWMO1.

The majority of these species are considered widespread and common in Ontario (i.e., provincial ranking of S5).

Photo 13: Downy Woodpecker in FOCM4 1 (October 23, 2020)



Photo 14: Eastern Grey Squirrel in FOCM4 1 (October 23, 2020)



4.1 Species at Risk (SAR)

The Species at Risk in Ontario (SARO) List is Ontario Regulation 230/08 issued under the *Endangered Species Act, 2007* (ESA 2007). The ESA 2007 provides both species protection (Section 9) and habitat protection (Section 10) to species listed as “Endangered” or “Threatened” on the SARO List. If an activity or project will result in adverse effects to Endangered or Threatened species and / or their habitat, additional action would need to be taken by a proponent to remain in compliance with the ESA 2007. Species listed as “Special Concern” are not afforded legal protection under the ESA, however, they may receive protection by some agencies, such as provincial and national parks, or other acts, such as the *Ontario Fish and Wildlife Conservation Act*, and the *Migratory Birds Convention Act* (MBCA), which prohibits the killing, capturing, injuring, harassment, and trapping of specially protected species.

4.1.1 Birds

A review of the OBBA (17NJ9265 & 17NJ9365) indicated the potential for the following provincial SAR bird species in the general vicinity of the Study Area:

- Bank Swallow (*Riparia riparia*) – Threatened;
- Bobolink (*Dolichonyx oryzivorus*) – Threatened;
- Chimney Swift (*Chaetura pelagica*) – Threatened;
- Barn Swallow (*Hirundo rustica*) – Special Concern;
- Common Nighthawk (*Chordeiles minor*) – Special Concern;
- Eastern Meadowlark (*Sturnella magna*) – Threatened;
- Eastern Whip-poor-will (*Antrostomus vociferous*) – Threatened;
- Eastern Wood-pewee (*Contopus virens*) – Special Concern;
- Least Bittern (*Ixobrychus exilis*) Threatened;
- Red-Headed Woodpecker (*Melanerpes erythrocephalus*) – Special Concern; and
- Wood Thrush (*Hylocichla mustelina*) – Special concern.

Potential for SAR and SAR habitat in the Study Area is evaluated in the SAR Screening Table attached.

The Study Area represents suitable habitat for Barn Swallows on all three bridge structures. No evidence of nesting was observed on any of the three structures and no Barn Swallows were observed during the site assessment.

FOMM4-2 and FOMM7-2 forests in the Study Area may represent potential habitat for Eastern Wood-pewee and Wood Thrush, however suitable habitat in the Study Area is considered marginal in the absence of preferred intermediate to mature forests. Although a thicker understorey is present for Wood Thrush, the preferred Sugar Maple and American Beech species are not present in these forest communities.

Common Nighthawk prefer open and flat areas of dune, beach or recently harvested forest, grassland pastures or marsh breeding habitat. The mixed and coniferous forest that they may inhabit for roosting are present, however, suitable habitat is considered marginal based on the limited availability of open vegetation free habitat in these communities that have thick understoreys.

Potential habitat for the remaining SAR birds listed above was not observed in the Study Area.

Bank Swallows were not observed during the field assessment. The creek banks did not possess the vertical slopes required by Bank Swallows.

Bobolink and Eastern Meadowlark, prefer large areas (minimum of 10 ha) of grassland habitat, which is not present in the Study Area which consists of forest and swamp communities.

Chimney Swift habitat was not present as no chimneys or suitable hollow trees were observed in the Study Area.

Least Bittern habitat was not present as no suitable marsh wetland habitat is present on-site. Swamp wetland communities present are White Cedar dominant with closed canopy and not the characteristic large marsh community dominated by cattails or other robust emergent vegetation.

Red-headed Woodpecker habitat is not present as the preferred open deciduous forests and grasslands are not present. Roadsides are bordered by dense coniferous dominated swamps (SWM01, SWCM1-2, SWCM1) and forest edges are also dense and coniferous dominated (FOCM4-1; FOMM4-2; FOMM7-2).

4.1.2 Candidate Bat Maternity Roosting Habitat

Since 2013, four bat species have been listed as endangered under the *Endangered Species Act 2007* due to rapid declining population sizes caused by White-nose Syndrome (WNS).

Among the four listed species, three are known to roost in forested habitats; Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), and Tri-colored Bat (*Pipistrellus subflavus*). While Little Brown Bat typically choose maternity roosts in anthropogenic structures, according to MNR and Environment Canada (2015), key features of significant bat maternity roosting habitat sites for Northern myotis and Tri-colored bat species, and to a lesser extent Little brown myotis, include:

- Deciduous Forest (FOD), Mixedwood Forest (FOM), Coniferous Forest (FOC), Deciduous Swamp (SWD), Mixedwood Swamp (SWM) and Coniferous Swamp (SWC) communities;
- Older forest stands that typically feature increased snag availability for roosting and foraging under a relatively closed canopy and mature large-diameter trees with >25 cm DBH;
- Cavities with small entrances/crevices or loose bark; and
- Cavities in tall tree snags of live trees that exhibit early to mid-stages of decay.

Trees which may be suitable for roosting bats, including trees with > 25 cm DBH with potential for cavities / snags, were observed within the Study Area.

Snag trees >25 cm DBH, with dying limbs and preferred tree cavities / snags or peeling bark were observed within the Study Area in the FOMM7-2, SWCM1-2, and SWMO1.

Based on site observations and a review of aerial photographs, six of the 8 ELC vegetation community types present in the Study Area are considered to be key features preferred by bats for roosting, consisting of open areas and preferred treed communities of SWMO1, SWCM1, SWCM1-2, FOCM4-1, FOMM4-2 and FOMM7-2. These communities have some potential for large diameter trees with cavities / loose bark. Suitable foraging habitat for bats may be associated with the open watercourse features of Humber River as well as its tributary within the Study Area and an open aquatic feature beyond the Study Area within the SWMO1 community north of Patterson Side Road in between Bridge 1 and Bridge 2.

4.1.3 Amphibians and Reptiles

A review of the ORAA Square 17NJ96 identified the following provincial Special Concern or Specially Protected amphibian and reptile species were identified as having potential to be located within the Study Area:

- Snapping Turtle (*Chelydra serpentina*) (ORAA – 2019); and
- Midland Painted Turtle (*Graptemys geographica*) (ORAA – 2019).

Snapping Turtle is provincially listed as a Special Concern species on the SARO list and has been designated as a Specially Protected Reptile under the *Ontario Fish and Wildlife Conservation Act*. The Midland Painted Turtle has been designated as a Specially Protected Reptile under the *Ontario Fish and Wildlife Conservation Act*. The ORRA database noted observations of Midland Painted Turtle and Snapping Turtle in 2019, indicating recent presence in the vicinity of the Study Area.

Snapping Turtles, generally inhabit shallow waters, where they can hide under the soft mud and leaf litter and are usually found in large bodies of water but sometimes inhabit small ponds. During nesting season, female Snapping Turtles travel overland in search of suitable nesting sites and often take advantage of manmade structures for nest sites (especially gravel shoulders). Pettit *et al.*, (1995) reported that females travelled up to 2.02 km between their residence and a nesting area, whereas Obbard and Brooks (1980) found that the maximum round trip distance travelled between home range and nesting site was 16 km.

Gravel road shoulders in the Study Area may provide suitable nesting habitat for Snapping Turtle, however, watercourses in the Study Area lack the leaf litter and mud substrate preferred by Snapping Turtles. Suitable habitat for Snapping Turtles may be present in waterbodies or ponds located beyond the Study Area.

Midland Painted Turtle generally inhabit shallow, slow-moving creek watercourses with the opportunity for basking areas associated with open areas on shorelines and in-stream boulders and rocks protruding from the water. The open watercourse features of the Study Area appear to provide potentially suitable habitat for Midland Painted Turtle.

4.1.4 Monarch Butterfly Habitat

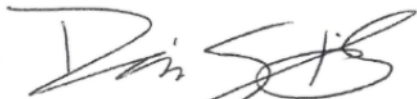
The Monarch (*Danaus plexippus*) was already assessed as a species of Special Concern in Ontario when the *Endangered Species Act* took effect in 2008. The Monarch's range extends from Central America to southern Canada. In Canada, Monarchs are most abundant in southern Ontario and Quebec, where breeding habitats, including milkweed plants, are widespread. Common Milkweed was observed at the edges of the SWMO1 and FOMM4-2 vegetation communities. Monarch butterflies were not observed within the SWMO1 and FOMM4-2 communities during the field assessment.

5.0 Preferred Solution

Project activities associated with the Alternative Solutions are anticipated to include but are not limited to grading and vegetation removal. Improvements are anticipated to be located primarily within the existing right-of-way with potential impact to trees and shrubs that encroach, including impact to wildlife species, Species of Special Concern (reptiles), SAR (bats), and associated habitat (e.g., snag trees, Milkweed, sole source food for Monarch), as a result of vegetation clearing and grading. It is anticipated that direct impact to wildlife species, Species of Special Concern, SAR can be avoided through timing and minimizing the footprint of construction.

Preferred Solution when determined will be evaluated for impacts and mitigation.

R.J. Burnside & Associates Limited



Devin Soeting, C.E.T., EP, CAN-CISEC
Project Coordinator

DS:tc

Enclosure(s) Figure 1 – Existing Conditions: ELC
Appendix A – SAR Table

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- Bridge
- Watercourse
- ELC Boundary (RJB)
- ELC Boundary (TRCA)
- Study Area

Sources:

1. Ministry of Natural Resources and Forestry, © Queen's Printer for Ontario.
2. Natural Resources Canada © Her Majesty the Queen in Right of Canada.

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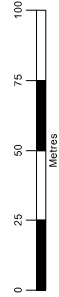
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Datum: North American 1983 CSRS
Coord. System: NAD 1983 CSRS UTM Zone 17N
Projection: Transverse Mercator
Central Meridian: 81900.000m
False Northing: 0m
False Easting: 500000.00m
Scale Factor: 0.99960
Page Orientation: 295.54°



Grid North



Client

TOWN OF CALEDON

Figure Title

PATTERSON SIDEROAD BRIDGE 1 AND 2

ECOLOGICAL LAND CLASSIFICATION

Drawn	Checked	Date	Figure No.
HN	SR	2020/12/04	1
Scale	Project No.		
H 1:1,750	300051839		

ELC Descriptions	Mixed Forest
CUP3-C: White Spruce Coniferous Plantation	MAS2-1b: Narrow-leaved Cattail Mineral Shallow
CUT1-1: Surnac Deciduous Thicket	Marsh
CUM1-A-1: White Cedar Successional Woodland	OAO: Open Aquatic
FOC3-1: Fresh-Moist Hemlock Coniferous Forest	OAO1: Open Aquatic (unvegetated)
FOC4-1: Fresh-Moist White Cedar Coniferous Forest	SWCM1: White Cedar Mineral Coniferous Swamp
FOC4-1: Fresh-Moist White Cedar Coniferous Forest	SWCM1-2: White Cedar - Conifer Mineral Coniferous Swamp
FOC4-1: Fresh - Moist White Cedar Coniferous Forest	SWM1-1: White Cedar - Hardwood Mineral Mixed Swamp
FOC4-1: Fresh-Moist White Cedar - Hardwood	SWM4-1: White Cedar - Hardwood Organic Mixed Swamp
FOC4-1: Fresh - Moist White Cedar - Poplar Mixed Forest	SWM01: White Cedar Organic Mixed Swamp
FOC4-1: Fresh - Moist White Cedar - Hardwood	WODM5: Fresh - Moist Deciduous Woodland

Appendix A: Screening Table - Background Review of Species at Risk and Species of Conservation Concern Potentially Present in the Study Area
Patterson Bridge 1, 2 & Duffy Lane Bridge EA, Caledon (300051839.0000)

Common Name	Scientific Name	Provincial S-RANK ¹	Provincial SARO Status ²	COSEWIC ³	Federal SARA Status ³	Federal SARA Schedule ⁴	Habitat Description	Habitat Present in Study Area?	Species Observed In Study Area During Site Assessment?
BIRDS									
Bank Swallow (Source: OBBA)	Riparia riparia	S4B	THR	THR	THR	1	In Ontario, Bank Swallows typically nest in exposed vertical earthen banks, created by erosion, along watercourses and lakeshores. It has also adapted to nesting in these banks in sand and gravel pits, along roadsides and in stockpiles of soil and other materials. The largest populations are supported by the shorelines of the lower Great Lakes, and they can also be found throughout southern Ontario in the Carolinian and Lake Simcoe-Rideau regions. ⁷	No. No exposed, eroded riverbanks, pits, stockpiles, and other suitable habitat are not present on site.	No.
Barn Swallow (Source: OBBA)	Hirundo rustica	S4B	SC	SC	THR	1	Barn Swallows usually build mud nests on ledges of walls in, or outside, of a barn or other man-made structures, including buildings and bridges. Natural nesting locations include caves and cliffs, but they are now rarely used. They often nest in small colonies in areas often associated with other insectivores. Foraging occurs in open areas where insects are present: Over water, meadows, marshes, and agricultural fields. They are most abundant south of the Canadian Shield, within agricultural lands in the Carolinian and Lake Simcoe-Rideau regions. ⁵	Yes. Bridge structures suitable for nesting on site.	No nests observed.
Bobolink (Source: OBBA)	Dolichonyx oryzivorus	S4B	THR	THR	THR	1	Bobolinks generally prefer open grasslands and hay fields for nesting, typically featuring relatively tall vegetation. Sometimes uses large fields (>50 ha) of winter wheat and rye in southwestern Ontario. Sensitive to vegetation structure and composition, they are positively associated with high grass-to-forb ratios, and moderate litter depth. They tolerate wetter portions of fields and are more likely to nest closer to field centers rather than field margins. They have a lower tolerance to the presence of patches of bare ground and appear to prefer larger fields (>10 ha). ^{5,7} This area sensitivity is also heavily influenced by the amount of regional grassland cover.	No. No open grasslands featuring tall vegetation are present on site.	No.

Common Name	Scientific Name	Provincial S-RANK ¹	Provincial SARO Status ²	COSEWIC ³	Federal SARA Status ³	Federal SARA Schedule ⁴	Habitat Description	Habitat Present in Study Area?	Species Observed In Study Area During Site Assessment?
Chimney Swift (Source: OBBA)	Chaetura pelagica	S4B,S4N	THR	THR	THR	1	Chimney Swifts have historically nested / roosted in deciduous and coniferous, typically wet, forest types, with a well-developed, dense shrub layer. Currently, most are found in anthropogenic structures, most commonly in uncapped chimneys.	No. No chimneys or suitable hollow trees were observed in the Study Area.	No.
Common Nighthawk (Source: Burnside)	Chordeiles minor	S4B	SC	SC	THR	1	Prefers open, vegetation-free habitats, including dunes, beaches, recently harvested forests, burnt-over areas, logged areas, rocky outcrops, rocky barrens, grasslands, pastures, peat bogs, marshes, lakeshores, and river banks for breeding. This species also inhabits mixed and coniferous forests. Can also be found in urban areas (nest on flat roof-tops).	Low. There are no open and flat areas of dune, beach or recently harvested forest, grassland pastures or marsh habitat suitable for breeding for this species. There are mixed and coniferous forests present but White Cedar dominated with a thick understorey.	No.
Eastern Meadowlark (Source: OBBA)	Sturnella magna	S4B	THR	THR	THR	1	Generally, prefers grassy pastures, meadows, and hay fields. Prefers moderately tall grass with abundant litter cover. a high proportion of grass cover, moderate forb density, low proportions of shrub and woody vegetation cover, and low percent of bare ground. Prefers to nest in drier sites and frequently nests around field margins. ^{5, 7}	No. No field habitat suitable for nesting / foraging (i.e., tall grass pasture, and meadows, etc.) is present on site.	No.
Eastern Whip-poor-will (Source: MNRF, OBBA)	Antrostomus vociferus	S4B	THR	THR	THR	1	Generally, prefer semi-open deciduous forests or patchy forests with clearings: areas with little ground cover are also preferred. In winter they occupy primarily mixed woods near open areas.	No. The preferred semi-open deciduous forests with clearings are not present. Dense coniferous dominated SWM01, SWCM1-2, SWCM1, FOCM4-1/2 forests are present on-site.	No.
Eastern Wood-pewee (Source: OBBA)	Contopus virens	S4B	SC	SC	SC	1	This species is known to inhabit the mid-canopy layer of forest openings and edges of deciduous and mixed forests (MNRF 2018). It is most abundant in intermediate-age mature forest stands with little understorey vegetation (MNRF 2018). Eastern Wood-pewees generally nest in the interior of deciduous and mixed-wood forested habitats but are often found foraging along woodland edges and within forest gaps. They do not require large habitats, but occurrences are noted less frequently in woodlots surrounded by development than in those without. Species distribution is throughout southern and northern Ontario, occurring less in the Hudson's Bay Lowlands. ⁵	Low. The mixed wooded FOMM4-2 community is present but with a thick understorey.	No.

Common Name	Scientific Name	Provincial S-RANK ¹	Provincial SARO Status ²	COSEWIC ³	Federal SARA Status ³	Federal SARA Schedule ⁴	Habitat Description	Habitat Present in Study Area?	Species Observed In Study Area During Site Assessment?
Least Bittern (Source: Burnside)	<i>Ixobrychus exilis</i>	S4B	THR	THR	THR	1	This species is typically located near pools of open water in relatively large marshes dominated by cattail and other robust emergent vegetation. ⁵	No. No suitable marsh wetland habitat is present on-site. The swamps present are White Cedar dominant with closed canopy.	No.
Red-headed Woodpecker (Source: OBBA)	<i>Melanerpes erythrocephalus</i>	S4B	SC	END	THR	1	Generally, prefer open oak and beech forests, grasslands, forest edges, orchards, pastures, riparian forests, roadsides, urban parks, golf courses, and cemeteries, as well as along beaver ponds and brooks. ⁶	No. The preferred open deciduous forests and grasslands are not present. Roadsides are bordered by dense coniferous dominated SWM01, SWCM1-2, SWCM1, FOCM4-1/2 forests.	No.
Wood Thrush (Source: OBBA)	<i>Hylocichla mustelina</i>	S4B	SC	THR	THR	1	The Wood Thrush breeds in southeastern Canada, from southern Ontario, east to Nova Scotia. Nesting typically occurs in second-growth, mature deciduous, and mixed forests. The presence of tall trees and a thick understory are usually prerequisites for site occupancy. ^{6,8} They prefer large forested areas, but they may also nest in small forest fragments. Nest building commonly occurs in Sugar Maples and American Beech saplings, trees or shrubs. ⁹ Wintering occurs in Central America, along the Atlantic and Pacific slopes. ⁶	Low. The mixed wooded FOMM4-2 community is present but does not possess the tall mature deciduous trees; it is cedar dominated with poplars and not the preferred Sugar Maples and American Beech.	No.
INSECTS									
Monarch (Source: Burnside)	<i>Danaus plexippus</i>	S2N,S4B	SC	END	SC	1	Monarchs can be found in areas that Milkweed (<i>Asclepias</i> sp.) and other wildflowers are present. This includes open spaces (fields), abandoned farmland, and roadsides. Pin-sized green eggs are laid on the underside of Milkweed species (<i>Asclepias</i> spp.), which are the primary food source of the Monarch caterpillar. Adult Monarchs migrate in late summer / early fall. Overwintering occurs along the California coast, and the Oyamel Fir Forest in central Mexico. ^{8a1}	Yes. Appropriate foraging and breeding habitat was present in the open roadside area and noted within SWM01 and FOMM4-2 community edges.	No. No Monarch were observed.
MAMMALS									
Eastern Small-Footed Myotis (Source: MNRF)	<i>Myotis leibii</i>	S2S3	END	-	-	-	Eastern Small-footed Myotis can be found from southern Georgian Bay to Lake Erie, and east to the Pembroke area. Record sightings also exist within the Bruce Peninsula, the Espanola area, and Lake Superior Provincial Park. ⁸	No. Hibernacula is not present (i.e., caves / mines). Roosting habitat is not considered present, given its preference for open, sunny rocky	No.

Common Name	Scientific Name	Provincial S-RANK ¹	Provincial SARO Status ²	COSEWIC ³	Federal SARA Status ³	Federal SARA Schedule ⁴	Habitat Description	Habitat Present in Study Area?	Species Observed In Study Area During Site Assessment?
Little Brown Myotis (Source: MNRF)	Myotis lucifugus	S3	END	END	END	1	<p>Roosting habitat: During the spring and summer they will roost under rocks, in rock outcrops, in buildings, under bridges, or in caves, mines or hollow trees. They often change their roosting locations every day.⁸</p> <p>Hibernacula: Caves and abandoned mines that tend to be colder and drier than the hibernacula of similar bats, and they will return to the same hibernacula every year. As with Little Brown Myotis, Eastern Small-footed myotis populations have been declining rapidly due to a fungal infection (White-nose Syndrome) that affects bats while in hibernation.⁹</p> <p>Population distribution within Canada includes the boreal forest, south of the tree line through to the U.S. border.¹⁰</p> <p>Roosting habitat: Mainly considered to be a cavity-roosting species; however, tree foliage and rock crevices may also be used for day and maternity roosting. Communal night roosts are used when temperatures are cool and tend to be in spaces that are warm or can be warmed by an accumulation of bats. Females prefer to roost in maternity colonies, preferring tree cavities, exfoliating bark, cracks and crevices in cliffs and small caves and crevices heated by hot springs. Temperature is the principal criterion for the selection of a maternity roost location. Maternity colonies form just after bats come out of hibernation (late April and early May) and are located within 1 km of water.¹⁰</p> <p>Hibernacula: Hibernation typically takes place in caves or abandoned mines, with favourable temperatures and humidity conditions. Migration to hibernation sites can be up to 1,000 km, and typically occurs in early September.¹¹ Little Brown Myotis populations in Ontario have declined dramatically in recent years due to White-nose Syndrome, a fungal infection caused by <i>Pseudogymnoascus destructans</i>, which infects bats while in hibernation.¹⁰</p>	habitats within close proximity to its hibernacula.	No.
							<p>High.</p> <p>Snags were present in preferred swamp (SWM01, SWCM1-2, AND SWCM1) and forests (FOMM4-2, FOMM7-2) adjacent to and within ROW in the study area and permanent water body sources for foraging are present.</p>		

Common Name	Scientific Name	Provincial S-RANK ¹	Provincial SARO Status ²	COSEWIC ³	Federal SARA Status ³	Federal SARA Schedule ⁴	Habitat Description	Habitat Present in Study Area?	Species Observed In Study Area During Site Assessment?
Northern Myotis (Source: MNRF)	Myotis septentrionalis	S3	END	END	END	1	<p>Roosting habitat: Males and non-breeding females roost alone or in small groups, choosing trees, caves, and buildings. Breeding females roost in tree hollows, cavities, crevices or under loose bark of living or decaying trees, sometimes in groups of up to 60 adults. They often change roosting locations every few days. Prey mainly includes terrestrial insects such as flies, moths, beetles, caddisflies, lacewings, and leafhoppers, as well as non-flying species, such as spiders and caterpillars. They tolerate cooler conditions than the Little Brown Myotis and are therefore not usually found near that species.¹⁰</p> <p>Hibernacula: Tend to enter hibernation later than other species, around late September to early November, and will emerge from hibernation sometime between March and May. They spend the summer relatively close to their hibernacula (56 km between summer and winter sites).¹⁰ As with Little Brown Myotis, White-nose Syndrome has caused a dramatic decline in Ontario populations.¹⁰</p>	High. Snags were present in preferred swamp (SWM01, SWCM1-2, AND SWCM1) and forests (FOMM4-2, FOMM7-2) adjacent to and within ROW in the study area and permanent water body sources for foraging are present.	No.
Tri-colored Bat (Source: MNRF)	Perimyotis subflavus	S3?	END	END	END	1	<p>Roosting habitat: Females roost alone, or in small colonies, and have been shown to exhibit fidelity to small roosting areas. Foraging typically occurs in forested riparian areas, over open water and in relatively open areas. Studies have shown that Tri-colored bats forage in forested areas with the greatest coverage, suggesting that they may avoid agricultural clearings, urban areas and areas where forest harvesting has occurred.¹⁰</p> <p>Hibernacula: Tends to hibernate in the deepest parts of caves or abandoned mines, where temperature is least variable and humidity levels are high. They hibernate solitary and exhibit high fidelity to hibernacula.¹⁰</p>	High. Snags were present in preferred swamp (SWM01, SWCM1-2, AND SWCM1) and forests (FOMM4-2, FOMM7-2) adjacent to and within ROW in the study area and permanent water body sources for foraging are present.	No.

Common Name	Scientific Name	Provincial S-RANK ¹	Provincial SARO Status ²	COSEWIC ³	Federal SARA Status ³	Federal SARA Schedule ⁴	Habitat Description	Habitat Present in Study Area?	Species Observed In Study Area During Site Assessment?
REPTILES & AMPHIBIANS									
Midland Painted Turtle (Source: ORAA)	<i>Chrysemys picta marginata</i>	S4	-	SC	SC	-	Inhabits waterbodies, such as ponds, marshes, lakes, and slow-moving creeks, that have a soft bottom and provide abundant basking sites and aquatic vegetation. These turtles often bask on shorelines or on logs and rocks that protrude from the water. The midland painted turtle hibernates on the bottom of waterbodies.	Yes. Appropriate habitat exists within the study area.	No.
Snapping Turtle (Source: ORAA)	<i>Chelydra serpentina</i>	S3	SC	SC	SC	1	Snapping Turtles generally inhabit shallow waters, where they can hide under the soft mud and leaf litter. Nesting sites usually occur on gravelly or sandy areas along streams. They often take advantage of man-made structures for nest sites, including roads (especially gravel shoulders), dams and aggregate pits. During nesting season, females travel overland in search of suitable nesting sites. ⁵	Yes. Appropriate habitat exists within the study area.	No.

^{**} Sources: Natural Heritage Information Centre (NHIC) database searched on December 1, 2020 for square 17NJ9625; Ontario Reptile and Amphibian Atlas (ORAA) for Square 17NK96; searched online on December 1, 2020; Ontario Breeding Bird Atlas (OBBA) 2001-2005 database for Square 17NK96 searched online on December 1, 2020.

¹S-Ranks (provincial)

Provincial (or Subnational) ranks are used by the 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 global ranks, but consider only those factors within the political boundaries of Ontario (Please refer to: http://dx.doi.org/10.29399/geoandherald.com/nhic_ranks.html). S-Ranks obtained from the NHIC updated December 1, 2020.

SX — Presumed Extirpated. Species or community is believed to be extirpated from the province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.
SH — Possibly Extirpated (Historical) - Species or community occurred historically in the province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years. A species or community could become SH without such a 20-40 year delay if the only known occurrences in a province were destroyed or if it had been extensively and unsuccessfully looked for. The SH rank is reserved for species or communities for which some effort has been made to relocate occurrences, rather than simply using this status for all elements not known from verified recent collections.

S1 — Critically Imperiled - Critically imperiled in the province or state 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 from the province.

S2 — Imperiled - Imperiled in the province due to a very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the province.

S3 — Vulnerable - Vulnerable in the province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation from the province.

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 the province.

SNR — Unranked - Province conservation status not yet assessed.

SU — Unranked - Clearly vulnerable 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.

SMS# — 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., S1-SU is used rather than S1S4).

S#? — Inexact or Uncertain - Denotes inexact or uncertain numeric rank.

Breeding Status Qualifiers

B — Breeding Conservation status refers to the breeding population of the species in the nation or state/province.

N — Nonbreeding Conservation status refers to the non-breeding population of the species in the province.

M — Migrant species occurring regularly on migration at particular staging areas or concentration spots where the species might warrant conservation attention. Conservation status refers to the aggregating transient population of the species in the province.

²SARO Endangered Species Act, 2007

(Provincial status from <https://www.ontario.ca/page/species-risk-identification> updated November 13, 2018)

The provincial review process is implemented by the Committee on the Status of Species at Risk in Ontario (COSSARO).

Extinct - A species that no longer exists anywhere.

Extirpated (EXT) - Lives somewhere in the world, and at one time lived in the wild in Ontario, but no longer lives in the wild in Ontario.

Endangered (END) - Lives in the wild in Ontario but is facing imminent extinction or extirpation.

Threatened (THR) - Lives in the wild in Ontario, is not endangered, but is likely to become endangered if steps are not taken to address factors threatening it.

Special concern (SC) - Lives in the wild in Ontario, is not endangered or threatened, but may become threatened or endangered due to a combination of biological characteristics and identified threats.

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 recommendation.

³**SARA Federal Species at Risk Act) Status and Schedule (includes COSEWIC Status)**
The Act establishes Schedule 1, as the official list of wildlife species at risk. It classifies those species as being either: Extirpated, Endangered, Threatened, or Special Concern. Once listed, the measures to protect and recover a listed wildlife species are implemented. Obtained from the Species at Risk Public Registry on December 10, 2018.

Extinct - A wildlife species that no longer exists.

Extirpated (EXT) - A wildlife species that no longer exists in the wild in Canada, but exists elsewhere.

Endangered (END) - A wildlife species facing imminent extirpation or extinction.

Threatened (THR) - A wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.

Special Concern (SC) - A wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats.

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.

Not At Risk (NAR) - A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.

⁴**SARA Schedule**

Species at Risk Public Registry on December 10, 2018.

Schedule 1: is the official list of species that are classified as extirpated, endangered, threatened, and of special concern.

Schedule 2: species listed in Schedule 2 are species that had been designated as endangered or threatened, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.

Schedule 3: species listed in Schedule 3 are species that had been designated as special concern, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.

The Act establishes Schedule 1 as the official list of wildlife species at risk. However, please note that while Schedule 1 lists species that are extirpated, endangered, threatened and of special concern, the prohibitions do not apply to species of special concern.

Species that were designated at risk by COSEWIC prior to October 1999 (Schedule 2 & 3) must be reassessed using revised criteria before they can be considered for addition to Schedule 1 of SARA. After they have been assessed, the Governor in Council may on the recommendation of the Minister, decide on whether or not they should be added to the List of Wildlife Species at Risk.

Sources:

⁵ Cadman, M.D., et al. (eds.), 2007. *Atlas of the Breeding Birds of Ontario, 2001-2005*. Ontario Ministry of Natural Resources, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto, xxii + 706 pp

⁶ Species at Risk Public Registry <http://www.sararegistry.gc.ca>

⁷ McCracken, J.D., et al. 2013. Recovery Strategy for the Bobolink (*Dolichonyx oryzivorus*) and Eastern Meadowlark (*Sturnella magna*) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources and Forestry, Peterborough, Ontario, viii + 88 pp.

⁸ MNRF SARA List Species Descriptions (<https://www.ontario.ca/page/species-risk-ontario#section-1>)

⁹ COSEWIC Species Assessment Reports

¹⁰ Naughton, Donna. 2012. *The Natural History of Canadian Mammals*. Canadian Museum of Nature and University of Toronto Press, Toronto, + 784 pp

¹¹ Farrar, John Laird. 2017. *Trees in Canada*. Natural Resources Canada [Canada Forest Services, and, Fitchery & Whiteside Limited, pp.238 – 239

¹² Significant Wildlife Habitat. Technical Guide – Appendix G – Table G-3