



ENVIRONMENTAL IMPACT STUDY
Old Shiloh Bridge
Town of Georgina
Amended January 2024



RIVERSTONE
ENVIRONMENTAL SOLUTIONS INC.



RIVERSTONE

ENVIRONMENTAL SOLUTIONS INC.

February 2, 2024
RS# 2022-261

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**SUBJECT: Environmental Impact Study as part of Municipal Class EA
Update 1: Preliminary Design
Conc. 2 – Old Shiloh Rd. Bridge
Town of Georgina**

Dear Emma:

RiverStone Environmental Solutions Inc. is pleased to provide you with the attached report.

Please contact us if there are any questions regarding the report, or if further information is required.

Best regards,

RiverStone Environmental Solutions Inc.

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Senior Ecologist / Principal

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ENVIRONMENTAL ASSESSMENT NON-TECHNICAL SUMMARY

Type of Study Environmental Impact Study		Date February 2, 2024
Project Manager Bev Wicks	Civic Address 2 nd Concession Town of Georgina	Development Proposed Environmental Assessment
	Planning Authorities Town of Georgina	Proponent/Agent Tatham Engineering
<p><u>Report Summary</u></p> <p>The purpose of this study is to assess natural heritage features and functions associated with a bridge crossing over the Pefferlaw River in the Town of Georgina, known locally as the ‘Old Shiloh Bridge’. The crossing is associated with a riparian area to the Pefferlaw River that supports features including wetlands, woodlands, and wildlife habitat. This report is provided as an update to a preliminary assessment of site-specific natural heritage features and functions that may be present proximate to the bridge, to support a Class Environmental Assessment being coordinated by Tatham Engineering. The updated assessment included additional field investigations and a refinement to the impact assessment to focus on potential impacts of the preferred solution selected through the Environmental Assessment.</p> <p>Several preliminary mitigation planning measures have been recommended to ensure that works do not result in a net negative impact to the natural environment. These measures are summarized in the list below.</p>		

Summarized Mitigation Recommendations

- **Prepare and submit a request for project review to the Department of Fisheries and Oceans (DFO) and adhere to all requirements of DFO in project planning and implementation.**
- **Consult with LSRCA regarding any requirements for regulated feature offsetting/compensation related to minor encroachment into wetlands as applicable.**
- **Activities and works in water must be designed and planned such that loss or disturbance to aquatic habitat is minimized as applicable.**
- **All in-water work must be isolated and completed in ‘dry’ conditions, with work area dewatered as applicable.**
- **Fish salvage must be undertaken prior to any de-watering of stream areas and following any work area flooding. Permits must be obtained from MNRF prior to fish salvage as applicable.**
- **Prepare a post-construction stabilization and restoration plan for any new surfaces, embankments, or areas otherwise directly disturbed by construction staging. Apply a restoration seed mix composed of native species only (except for stabilizing cover crop).**

- **Minimize riverbank and bed hardening to the extent possible (if replacement structures are required, these should be designed to maintain the existing natural substrates and gradients and allows continued fish passage, i.e., open bottom).**
- **Minimize removal of overhanging vegetation to the extent possible.**
- **Avoidance disturbance to submerged boulders and woody debris material outside of the bridge development footprint and consider opportunities to replace in-stream fish habitat structure post-construction as applicable.**
- **Restore natural bed substrates within and adjacent to replaced crossing structures following construction as applicable.**
- **In-water works (if required) and diversion of flows should avoid spring timing window from March 15th to July 15th . Timing windows should be confirmed with MNRF and/or LSRCA as applicable.**
- **Implement sediment and erosion control measures as per applicable best management practices to isolate the development footprint.**
 - **Sediment fencing must be constructed of heavy material and solid posts and be properly installed (trenched in) to maintain its integrity during inclement weather events.**
 - **Additional sediment fencing and appropriate control measures must be available on site so that any breach can be immediately repaired.**
 - **Regular inspection and monitoring will be necessary to ensure that the structural integrity and continued functioning of the sediment control measures is maintained (i.e., proper installation is not the only action necessary to satisfy the mitigation requirements).**
 - **An on-site supervisor should be responsible for daily inspections of the sediment and erosion control measures during construction activities and record the time and date of inspections, the status of the mitigation measures, and any repairs undertaken.**
 - **Removal of non-biodegradable erosion and sediment control materials should occur once construction is complete, and the site is stabilized.**
- **Best Management practices should be utilized with all machinery and fill being imported to the subject property to ensure that material and tracks are free from invasive species (*Phragmites australis*, etc.).**
- **Machinery should arrive on site in clean condition and is to be checked and maintained free of fluid leaks.**
- **Machinery must be refueled, washed, and serviced within the area isolated by sediment fencing, a minimum of 30 m from wetlands and the top of watercourse bank.**
- **Locate all fuel and other potentially deleterious substances within the area isolated by sediment fencing, a minimum of 30 m from wetlands and the top of watercourse bank.**
- **Temporary storage locations of aggregate/fill material (where required) should be located within the area isolated by sediment fencing. Storage areas should be sited to the west of**

Pefferlaw Brook. This material is to be contained by heavy-duty sediment fencing, a minimum of 30 m from wetlands and the top of watercourse bank as applicable.

- **Offloading of construction and aggregate/fill materials (where required) should be completed during fair weather conditions, a minimum of 30 m from wetlands and the top of watercourse bank as applicable.**
- **All stockpiled topsoil/overburden (where required) should be piled in low piles and stabilized as quickly as possible (e.g., erosion-prone areas covered with textile) to minimize the potential for runoff and wind erosion as applicable.**
- **Minimize vegetation removal and disturbance to the extent possible, particularly adjacent to the watercourse.**
- **Prepare a TIPP to determine the extent of potential tree removals following bridge design. Construction exclusion, staging, and tree protection measures should be included in the TIPP for mitigation planning.**
- **Following preparation of the TIPP, review opportunities for re-planting of trees that require removal as applicable.**
- **Any minor tree removals required to accommodate the bridge replacement design must be completed outside of the season in which endangered bats may be active, *i.e.*, April – Oct, inclusive. If substantial tree removals are determined to be required (*i.e.*, beyond the ROW), additional assessment of habitat usage and significance may be warranted as applicable.**
- **Work site isolation must utilize sediment and erosion control that represents suitable wildlife exclusion fencing as per best management practises endorsed by the MECF.**
- **If any individual turtles are encountered within works area, activities that have the potential to harm such individuals should stop immediately. A qualified biologist or MECF should then be contacted to determine the most appropriate mitigation measure.**
- **Grading and other activities that cause disturbance outside of the development envelope should be minimized to the extent possible during the construction period.**
- **In the spring prior to construction, install temporary bird exclusion mesh underneath bridges to prevent establishment of nests within the season of construction.**
- **Clearing of vegetation must be restricted to times outside of the period April 15 to October 30. If development and site alteration must occur within the period of April 1 to Aug 30, a nest survey should be conducted by a qualified avian biologist prior to commencement of construction activities to identify and locate active nests of migratory bird species covered by the MBCA. If a nest is located or evidence of breeding noted, then a mitigation plan should be developed to address any potential impacts on migratory birds or their active nests. Mitigation may require establishing appropriate buffers around active nests or delaying construction activities until the conclusion of the nesting season. If any clearing of mature trees must occur within the period April 15 to Oct 30, further measures may need to be taken with respect to mitigating harm to endangered bats which have the potential occur on site as applicable.**

Table of Contents

1 BACKGROUND & CONTEXT..... 1

2 APPROACH AND METHODS 2

2.1 Identification of Study Area..... 2

2.2 Background Information Sources Reviewed 2

2.3 Site Investigation..... 3

2.3.1 Habitat-based Wildlife Assessment..... 4

2.3.2 Targeted Wildlife Assessment 4

2.3.3 Physical Assessment (Topography, Surficial Geology, & Drainage)..... 5

2.3.4 Vegetation Community Assessment..... 5

3 EXISTING CONDITIONS 7

3.1 General Site Conditions and Land Uses..... 7

3.2 Topography, Physiography, & Drainage 7

3.3 Fish and Wildlife Habitat..... 8

3.4 Vegetation Communities 8

3.4.1 CUM1: Mineral Cultural Meadow Ecosite..... 9

3.4.2 MAM2: Mineral Meadow Marsh Ecosite..... 9

3.4.3 FOC4: Fresh White Cedar Coniferous Forest Ecosite 9

3.4.4 FOM/CUW: Moist Mixed Forest/Cultural Woodland 9

3.4.5 SWT2: Mineral Thicket Swamp Ecosite 9

3.4.6 OA: Open Aquatic..... 9

4 KEY NATURAL HERITAGE Features ASSESSMENT 9

4.1 Streams & Fish Habitat..... 10

4.2 Lakes (and Littoral Zones)..... 11

4.3 Seepage Areas and Springs..... 11

4.4 Wetlands 11

4.5 Sand Barrens, Savannahs, Tallgrass Prairies, and Alvars 12

4.6 Areas of Natural and Scientific Interest (Life Science)..... 12

4.7 Significant Valleylands..... 12

4.8 Significant Woodlands 13

4.9 Habitat of Endangered and Threatened Species..... 14

4.9.1 Butternut (*Juglans cinerea*) 15

4.9.2	Black Ash (<i>Fraxinus nigra</i>).....	15
4.9.3	Endangered Bat Species (<i>Myotis lucifugus</i> , <i>Myotis septentrionalis</i> , <i>Perimyotis subflavus</i>)	15
4.10	Significant Wildlife Habitat.....	15
4.10.1	Bat Maternity Colonies.....	16
4.10.2	Deer Yarding Area & Migratory Corridor.....	16
4.10.3	Waterfowl Nesting Area.....	16
4.10.4	Wetland Amphibian Breeding Habitat & Movement Corridor	16
4.10.5	Special Concern and Rare Wildlife Species	17
5	IMPACT ASSESSMENT AND RECOMMENDATIONS.....	17
5.1	Proposed Activity.....	17
5.2	Impact Assessment	18
5.2.1	Streams, Wetlands, & Fish Habitat.....	19
5.2.2	Significant Valleylands.....	22
5.2.3	Significant Woodlands	22
5.2.4	Habitat of Endangered and Threatened Species.....	23
5.2.5	Significant Wildlife Habitat.....	23
6	PERMITTING & APPROVALS CONSIDERATIONS	26
7	SUMMARY & CONCLUSIONS	26
8	REFERENCES	26

List of In-text Tables

Table 1.	Site Investigations and Primary Tasks.....	3
Table 2.	Summary of the Assessment of Key Natural Heritage Features within the Study Area.....	9
Table 3.	Summary of Potential Impacts Resulting from Alternative Options.....	25

List of Figures

Figure 1. Study Area Location & Context.

Figure 2. Existing Conditions.

List of Appendices

Appendix 1. Planning & Regulatory Schedules.

Appendix 2. Photos of Representative Site Conditions.

Appendix 3. Background Natural Heritage Data.

Appendix 4. Endangered and Threatened Species Screening.

Appendix 5. Significant Wildlife Habitat Assessment.

Appendix 6. Proposed Bridge Design

1 BACKGROUND & CONTEXT

RiverStone Environmental Solutions Inc. (RiverStone), working in conjunction with Tatham Engineering (Tatham), was retained by the Town of Georgina (the Town) to prepare an Environmental Impact Study (EIS) to address potential replacement/rehabilitation of a crossing of Concession Rd. 2 (Old Shiloh Rd.) over the Pefferlaw River. The bridge, known locally as the Old Shiloh Bridge, spans a broad meander of Pefferlaw Brook, directly west of the hamlet of Udora (**Figure 1**). For context, this assessment has been undertaken in support of a Municipal Class Environmental Assessment (EA), providing an initial inventory and characterization of natural heritage features and functions that are expected to occur within the vicinity of the crossing. An initial assessment was completed in Feb 2023, using field data collected in 2022, to inform the selection of alternatives being contemplated as part of the EA. This report has been updated to include information from additional site investigations undertaken in 2023, and to focus the preliminary impact assessment on a now identified preferred solution.

For context, the bridge is located in the planning jurisdictions of the provincial Greenbelt Plan and Lake Simcoe Protection Plan, as administered by the Town and the Lake Simcoe Region Conservation Authority (LSRCA). The study area is located within the natural heritage systems (*i.e.*, Greenlands System) of both the Town and the Region (see **Appendix 1**), as well as the natural heritage system for the Greenbelt Plan (see **Figure 1** and **Appendix 1**). Pefferlaw Brook, the watercourse that is spanned by the bridge, as well as its associated hazard features (*e.g.*, floodplain, wetlands), are regulated by the LSRCA under Ontario Regulation 179/06 of the *Conservation Authorities Act* (see **Appendix 1**). The watercourse and its riparian zone support fish habitat, wetland communities, and various other wildlife habitat values. The natural corridor associated with the river valley provides important landscape-scale connective linkages for wildlife movements. The broader landscape connected to the river valley at Old Shiloh Bridge contains large tracts of continuous woodland cover, provincially significant wetlands, and areas of natural and scientific interest. These and other features and functions are considered within the scope of this report.

The preliminary list of alternatives being considered as part of this EA included the following:

- 1) Do nothing;
- 2) Rehabilitate the existing bridge;
- 3) Remove and replace the bridge; and
- 4) Construct a new bridge adjacent to the existing bridge.

Except for option #1, all alternatives were considered to have the potential to adversely impact one or more natural heritage features through various pathways, including impacts related to the construction staging process, as well as long-term changes to the stream channel and associated areas of natural cover. It is our understanding that the alternative preferred by the Town at this time is #3, removal and replacement of the bridge. This EIS assesses the potential for site-specific natural heritage impacts that may result from implementation of this solution. This report is provided at a high-level, being based on a review of available background information and scoped site investigations undertaken during ‘out of season’ conditions. Moreover, potential design for replacement of the bridge is in a preliminary stage, meaning that potential impacts cannot be quantified in detail. Therefore, this assessment is also considered preliminary and general in nature. Supplemental assessment may be required to address specific concerns of agencies and/or required authorizations, depending on the detailed design of the new bridge.

2 APPROACH AND METHODS

The approach and methods used to carry out this EIS are detailed in this section. Broadly speaking, this includes:

1. Identifying a study area in which to focus assessment efforts.
2. Gathering and reviewing background biophysical information for the study area, including existing natural feature mapping and records for species of conservation interest which are relevant to the study area.
3. Conducting a site investigation to field-verify the presence or absence of relevant features, *e.g.*, wetland communities, habitat for endangered or threatened species.
4. Determining the potential for negative impacts to identified features associated with implementation of various development alternatives.
5. Identifying methods by which potential negative impacts can be mitigated via avoidance, minimization, and/or compensation measures, to inform the selection of the preferred alternative.

2.1 Identification of Study Area

For the purposes of this report, RiverStone identified a study area centered on the existing bridge structure. The study area includes a 120 m radius as measured from the center of the bridge on 2nd Concession, consistent with direction in the Natural Heritage Reference Manual (NHRM) under the Provincial Policy Statement (PPS). Direct assessment is limited to the right of way (ROW), with lands beyond the ROW assessed to the extent feasible by visual review and aerial photo review.

2.2 Background Information Sources Reviewed

Background biophysical information related to the study area was collected and reviewed from a variety of sources. This includes:

- **Town of the Georgina Official Plan (Consolidated 2020)**
- **Region of York Official Plan (2022).**
- **Greenbelt Plan (2017) & Technical Guidance Documents**
- **Pefferlaw River Subwatershed Plan. 2012. Lake Simcoe Region Conservation Authority.**
- **Stream Monitoring in the Tributaries of Lake Simcoe: Fish Technical Progress Series in Stream Monitoring: Report No 1. Lake Simcoe Region Conservation Authority.**
- **Ministry of Natural Resources and Forestry (MNR) Natural Heritage Areas and Natural Heritage Information Centre (NHIC) database regarding information on occurrences of SAR and provincially tracked species (squares: 17PK4302, 17PK4303, 17PK4402, 17PK4403); accessed Dec 2023, at:**
http://www.gisapplication.lrc.gov.on.ca/mamnh/Index.html?site=MNR_NHLUPS_NaturalHeritage&viewer=NaturalHeritage&locale=en-US).
- **Species at Risk Information Request to Ministry of Environment, Conservation, and Parks (MECP) – sent Feb 14 2023; response received Feb 15 2023.**

- **Ontario Breeding Bird Atlas (OBBA) database and the Atlas of the Breeding Birds of Ontario, 2001–2005** (Cadman et al. 2007) regarding birds that were documented to be breeding in the vicinity of the study area during the 2001–2005 period (square: 17PK40; accessed at: <http://www.birdsontario.org/atlas/squareinfo.jsp>).
- **Ontario Reptile and Amphibian Atlas (ORAA)** database regarding records of reptiles and amphibians that have been observed within the vicinity of the study area (square: 17PK40; accessed Dec 2023 at: http://www.ontarioinsects.org/herpatlas/herp_online.html).
- **iNaturalist** database regarding general biodiversity records, with a focus on verified ‘research-grade’ observations within the vicinity of the study area, accessed Dec 2023 at: https://www.inaturalist.org/observations?place_id=any&subview=map.
- **Species at Risk (SAR) range maps** (accessed Dec 2023 at: <http://www.ontario.ca/environment-and-energy/species-risk-ontario-list>).
- **Distribution of Fish Species at Risk** generated by Fisheries and Oceans Canada (accessed at: <http://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html>).
- **Atlas of the Mammals of Ontario** (Dobbyn 1994) regarding mammal records within and adjacent to the study area.
- **Physiography of Southern Ontario** (Chapman and Putnam 2007) for information pertaining to the physiography and soils of the study area and adjacent lands.

2.3 Site Investigation

The background review of biophysical information as outlined in **Section 2.2** informed the scoping of an initial site investigation undertaken on Dec 7, 2022. Despite being outside of the ideal ‘leaf-on’ seasonal window, this site visit was able to inform a preliminary assessment of conditions within the study area, to the extent feasible via roadside-based surveys. Subsequent site investigations were undertaken on Oct 3 & 12, 2023 to further inform the assessment of existing conditions within the study area. While these surveys were not ideally timed in terms of capturing in-season conditions, spring and summer site work was not considered feasible given the schedule of the EA.

Notwithstanding, information derived from early fall data collection can often be considered suitable for the purpose of site characterization. This assumes that the collected data is reviewed conservatively and not treated as the basis for presence/absence of species that would not be verifiable during such timing windows. Instead, further reliance on a ‘habitat-based’ assessment is required (see **Section 2.3.1** below). Given the nature of this specific site and the context for the work proposed, the site work undertaken to date may be sufficient to inventory and characterize relevant features and functions. On-site data collection included the following tasks:

- Scoped vegetation inventory and delineation of ecological land classification (ELC) units, verified during leaf-on conditions of Oct 3, 2023 site visit;
- General assessment of wildlife habitat features and functions;
- Qualitative assessment of fish habitat and general aquatic habitat structure within the study area;
- Survey of bridge structure for bird nests;
- Assessment/inventory of features that may represent habitat for endangered and/or threatened species, including qualitative assessment of woodlands representing potential endangered bat habitat, and leaf-on inventory of potential occurrences of endangered tree species; and,

- Assessment of key hydrologic features (*e.g.*, wetlands, drainage features) to inform delineation of feature limits within the right of way (ROW), and approximation of feature limits in adjacent private lands.

Table 1. Site investigations and primary tasks.

Date	Primary Task(s)	Staff
Dec 7, 2022	ELC; wetland and drainage feature assessment; fish habitat assessment, vegetation inventory; general wildlife habitat assessment	M. Francis
Oct 3, 2023	ELC/wetland limit verification (roadside survey); SAR tree survey within ROW	M. Francis
Oct 12, 2023	Fish habitat assessment	T. Robinson

Evidence for the presence of a species (or use of an area by a species) was determined from visual and/or auditory documentation (*e.g.*, song, call) and/or observation of nests, tracks, burrows, browse, and scats (where applicable). If/where present, natural features of conservation interest (*e.g.*, SAR habitat, etc.) were digitized and delineated in the field with a high accuracy GPS. Features of interest were photographed, and all information collected was catalogued for future reference. Representative photographs detailing on-site conditions are provided in **Appendix 2**.

2.3.1 Habitat-based Wildlife Assessment

RiverStone’s primary approach to site assessment is habitat-based. We first focus on evaluating the potential for significant features and species within an area of interest, prior to undertaking any targeted assessments or surveys. An area is considered potential habitat if it satisfies several criteria, usually specific to a species, but occasionally characteristic of a broader group (*e.g.*, several species of turtles use sandy shorelines for nesting, several species of bats use cavity trees as day roosts and maternity sites, etc.). If habitat features are demonstrably absent from a study area, then targeted surveys would not be considered warranted to further support conclusions of the assessment.

Physical attributes of a site that can be used to assess habitat function include structural characteristics (*e.g.*, age and composition of forest canopy, water depth), ecological community (*e.g.*, meadow marsh, rock barren, coldwater stream), and structural connectivity to other habitat features required by a species of interest or indicator species. Species-specific habitat preferences and/or affinities are determined from status reports produced by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), Cadman et al. (2007), unpublished documents, and direct experience.

2.3.2 Targeted Wildlife Assessment

Where appropriate, RiverStone explores further targeted assessments in accordance with applicable standard methods and protocols. Targeted survey efforts may be undertaken due to one or more triggers, such as a specific request from an approval authority, an existing record for a species of interest, or a limitation to a habitat-based assessment. For this scoped study, targeted survey methodologies were generally not undertaken due to seasonal limitations and the timing of project initiation. As noted above, scoped assessments were undertaken to assess the potential functionality of fish habitat and to survey for the presence/absence of SAR trees within the road ROW.

Notwithstanding, given the nature of this specific site and the context for the work proposed, the site visits undertaken to date may be sufficient to conservatively inventory and characterize relevant features and functions.

2.3.3 Physical Assessment (Topography, Surficial Geology, & Drainage)

The geophysical setting of the study area was determined using topographic mapping, soils mapping, geological mapping, aerial photography, and descriptions gathered through on-site investigations. Drainage features (where present) are identified through the review of background mapping resources and/or delineated in the field.

2.3.4 Vegetation Community Assessment

All natural vegetation communities on the subject property were mapped according to Ecological Land Classification (ELC) community tables (Lee et al., 1998). ELC defines ecological units or communities based on bedrock, climate (temperature, precipitation), physiography (soils, slope, aspect), and corresponding vegetation. Use of the system permits biologists and other land managers to use a common language to describe vegetation communities, which in turn facilitates the identification of communities likely to support certain natural heritage features or functions. The ELC system is an organizational framework that can be applied at different scales. The ecological units most useful for site-specific evaluations are ecosites and vegetation types (also known as ecoelements).

In our experience, the ELC classification key is not comprehensive, and improvised classifications are occasionally used to describe communities, e.g., anthropogenic features. For this site, vegetation communities were delineated via aerial photo interpretation and subsequently confirmed and refined in the field. The boundaries of any identified wetland boundaries were delineated in accordance with the “50% wetland vegetation rule” as directed by the Ontario Wetland Evaluation System (OWES), where feasible. All observed vascular plant species are inventoried during the vegetation community assessment to identify any features/species of potential significance.

2.4 Key Natural Heritage Feature Assessment

Provincial and local planning policies employ varying terms for natural heritage features and designations that have recognized ‘statuses’ within the applicable planning jurisdiction. The study area is located within the planning areas for Ontario’s Greenbelt Plan and the Lake Simcoe Protection Plan (LSPP). The terminology used in this report is consistent with the Greenbelt Plan and LSPP, including reference to relevant features as ‘key natural heritage features’ (KNHF) and ‘key hydrologic features’ (KHF). RiverStone conducted a review of the background information sources identified in **Section 2.2** to determine if KNHF/KHFs have been identified in association with the study area by the province and/or local planning authority. The definition of KNHF/KHFs is generally consistent under both the Greenbelt Plan and LSPP; however, the Greenbelt Plan definition is most exhaustive and includes the following:

- Permanent & intermittent streams
- Lakes (and their littoral zones)
- Seepage areas and springs
- Wetlands (including provincially significant wetlands)
- Fish habitat
- Sand barrens, savannahs, tallgrass prairies, and alvars.
- Areas of natural and scientific interest (life science)
- Significant valleylands

- Significant woodlands
- Habitat of endangered and threatened species
- Significant wildlife habitat (includes habitat for rare and special concern species)

RiverStone assesses the potential presence of each of the above KNHF/KHFs in accordance with applicable technical guidance documents, including the following:

- *Greenbelt Technical Paper 1 – Technical Definitions and Criteria for Key Natural Heritage Features in the Natural Heritage System of the Protected Countryside* (2005; updated by MNRF as of 2012)
- *Natural Heritage Reference Manual (NHRM) for the Natural Heritage Policies of the Provincial Policy Statement* (MNRF 2010)
- *Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E* (MNRF 2015).

The potential presence/absence of relevant species of conservation interest, such as endangered and threatened species, are assessed using a combination of the background information review outlined in **Section 2.2** and the habitat-based approach outlined in **Section 2.3.1**. Our assessment of KNHF/KHFs is provided in **Section 4** of this report.

2.5 Impact and Mitigation Assessment

To carry out a defensible assessment of potential development impacts, RiverStone employs the following approach:

1. *Predict* impacts to identified natural heritage features within the study area based on the proposed development plan (from construction to post-completion), including both direct (*e.g.*, vegetation clearance) and indirect (*e.g.*, light pollution, encroachment post-development) impacts.
2. *Evaluate the significance* of predicted impacts to identified natural heritage features based on their spatial extent, magnitude, timing, frequency, and duration.
3. *Assess the probability or likelihood* that the predicted impacts will occur at the level of significance expected (*e.g.*, high, medium, low probability).

In instances where the potential for negative impacts to natural heritage features exists, mitigation measures are offered to avoid, minimize, and/or compensate for such impacts. RiverStone's natural heritage impact assessment and recommended mitigation measures are provided in **Section 5**.

2.6 Assessment of Conformance with Applicable Environmental Policies

There are several environmental policies (*e.g.*, statutes, regulations, plans, guidance documents, etc.) that may apply with the jurisdiction, including the list below. A scoped discussion of potential regulatory requirements is provided in **Section 6**.

- Federal *Fisheries Act*, R.S.C. 1985
- Federal *Migratory Birds Convention Act*, S.C. 1994, c. 22
- Provincial Policy Statement, 2020, pursuant to the *Planning Act*, R.S.O. 1990, c. P.13

- Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005.
- Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E.
- Provincial *Endangered Species Act*, S.O. 2007, c. 6
- Greenbelt Plan (2017)
- Lake Simcoe Protection Plan (2009)
- Region of York Official Plan (2022)
- Township of Georgina Official Plan (2016)
- Ontario Regulation 179/06 under the *Conservation Authorities Act*, R.S.O. 1990, c. C.27

3 EXISTING CONDITIONS

The following provides a description of the various existing conditions of the study area, including biological and physical characteristics identified through RiverStone’s background review and on-site investigations. **Sections 3.1 – 3.4** discuss the general findings of our background and in-field assessment, while **Section 4** provides a subsequent detailed assessment of those identified features that represent *significant* features, as derived through the collective site summary and background assessment.

3.1 General Site Conditions and Land Uses

The study area (**Figure 1**) is centred on a single crossing structure over Pefferlaw Brook. The bridge itself appears quite old and is generally surrounded by mixed natural cover. Photos detailing existing conditions during the on-site assessment are provided in **Appendix 2**.

Based on a review of historical aerial imagery, the study area and surrounding landscape have been steadily regenerating to natural cover over the past ~70 years following a major decrease in agricultural activities. Most of the study area is now in a naturalized state, composed of mixed successional forest communities and low-lying riparian zones associated with the subtle valleylands to Pefferlaw Brook. There are no signs of active land use within the study area; however, the bridge may be used as a launching point for watercraft and potentially for fishing. Outside of the immediate study area, the dominant land use is rural residential, with a strip of residences along Concession Rd 2 to the west and the Hamlet of Udora directly adjacent to the east. There appears to be a recreational camp/park located directly north of the study area, with camp sites spread out for over a kilometer near the east bank of the watercourse.

3.2 Topography, Physiography, & Drainage

The study area is contained within the Lake Simcoe drainage basin, part of the broader physiographic region known as the Simcoe Lowlands (Chapman and Putnam 1984). The location is situated in a linear swath of sand plain, dividing higher elevation till plains to the east and large areas of low-lying peat and muck deposits to the west. While the direct channel of Pefferlaw Brook is within an area mapped as ‘bottomland’ soils, the immediately adjacent lands are composed of a complex of sandy loams, including those of the Brighton and Granby series. Both soil classes are a product of sandy outwash materials, occurring on smooth to gently sloping topography and having drainage

characteristics ranging from good to poor. The entire study area sits at an approximate elevation of 230 m (above sea level), with a very subtle rise in elevation occurring to the both the east and west.

Drainage within the study area is facilitated by a single identified feature, Pefferlaw Brook. Areas up gradient from the watercourse appear to be imperfectly to poorly draining; however, no other discernable surface drainage features were observed within the study area. Physical characteristics of the reach of Pefferlaw Brook within the study area are discussed further under **Section 4.1**.

3.3 Fish and Wildlife Habitat

The cumulative results of RiverStone's background review, as well as habitat-based biological assessments indicate that the study area provides potential habitat for a variety of wildlife. RiverStone documented evidence on site for primarily generic wildlife species, including White-tailed Deer (*Odocoileus virginianus*), Raccoon (*Procyon lotor lotor*), Grey Squirrel (*Sciurus carolinensis*), Eastern Chipmunk (*Tamias striatus*), etc.

Only common, generalist bird species were documented during the out of season on-site investigations; and no targeted inventory was undertaken in this regard. Observed species included: Black-capped Chickadee (*Poecile atricapillus*), American Crow (*Corvus brachyrhynchos*), Mourning Dove (*Zenaida macroura*), and Downy Woodpecker (*Picoides pubescens*). A single bird nest was observed beneath the bridge that appeared to have been inactive for one or more seasons. Based on its structure, it is possible that this nest was used most recently by either an Eastern Phoebe (*Sayornis phoebe*) or Barn Swallow (*Hirundo rustica*); these species may re-use/re-build each others' nests in alternating years. A list of bird species documented within the local 10 km² OBBA data square is provided in **Appendix 3**.

No direct observations of any reptiles or amphibians were recorded during on-site investigations; however, RiverStone's site visit was not appropriately timed in this regard. It is assumed that suitable habitat features are present for certain species guilds (*i.e.*, turtles), and floodplain pools may be present throughout the study area that could support amphibian breeding habitat. Such potential functions are discussed further within the context of significant wildlife habitat. A list of herptile species documented within the local 10 km² ORAA data square is provided in **Appendix 3**.

Fish habitat was assumed to be present from the onset of this study, as Pefferlaw Brook represents a major watercourse with permanent flows. RiverStone's on-site investigations of fish habitat structure and function further refined our understanding of the habitat features that may be present within the study area. Fish habitat is described in further detail in **Section 4**.

Ultimately, all relevant observations of fish and wildlife species and/or habitat features, including individuals of species at risk or other species of conservation concern, are discussed in **Section 4** of this report within the context of KNHFs.

3.4 Vegetation Communities

Existing vegetation communities within the subject property were assessed through a combination of background review and on-site investigation. A desktop exercise was undertaken to map vegetation community boundaries using background information sources and current aerial photographs; the mapped vegetation communities were then ground-truthed to a high level and refined where necessary during the site investigation. Given the successional nature of some on-site vegetation assemblages, the assigned ELC codes/descriptions may be general in nature and non-conforming to the ELC guide. Vegetation community mapping with classifications generally based on Lee et al (1998) is provided on

Figure 2, and descriptions are provided below. Each description includes a list of representative plant species within each community. All species observed are considered common locally and provincially. A list of observed plant species can be provided upon request.

3.4.1 CUM1: Mineral Cultural Meadow Ecosite

This ecosite occurs within portions of the watercourse riparian zone where elevations are high enough to support moist upland plant assemblages of goldenrods (*Solidago* spp), Soapwort (*Saponaria officinalis*), asters (*Symphyotrichum lanceolatum*, *S. novae-angliae*), Raspberry (*Rubus strigosus*), and scattered patches of low Common Buckthorn (*Rhamnus cathartica*) and Manitoba Maple (*Acer negundo*).

3.4.2 MAM2: Mineral Meadow Marsh Ecosite

This ecosite occurs in the same open section of riparian/floodplain zone as CUM1 described above, but in slightly lower elevations. The predominant cover in these locations is a mix of Reed Canary-Grass (*Phalaris arundinacea*) and Joe-pye-weed (*Eutrochium maculatum*), with some sparse Cattail (*Typha* sp.) and Red-Osier Dogwood (*Cornus sericea*).

3.4.3 FOC4: Fresh White Cedar Coniferous Forest Ecosite

This ecosite is represented by areas of dense, successional White Cedar (*Thuja occidentalis*) canopy along subtle slopes. The dense shade supports minimal groundcover components, with Coltsfoot (*Tussilago farfara*) being the only noteworthy species. This ecosite intergrades with adjacent successional mixed forest, where Buckthorn, Apple (*Malus* sp.), and young Green Ash (*Fraxinus pennsylvanica*) are common.

3.4.4 FOM/CUW: Moist Mixed Forest/Cultural Woodland

This community is a successional mix of White Cedar with associates of Aspen (*Populus tremuloides*), White Spruce (*Picea alba*), Manitoba Maple, and mature thickets of Buckthorn. Viewed from the ROW, this area appeared quite variable with potential inclusions of thicket swamp mixed throughout (see Section 3.4.5 below).

3.4.5 SWT2: Mineral Thicket Swamp Ecosite

This ecosite occurs in areas of slightly lower elevation within the FOM/CUW complex described above. Cover includes a mix of Red-Osier Dogwood, Joe-pye-weed, Alder (*Alnus incana*), Balsam Poplar (*Populus balsamifera*), Reed Canary-Grass, and sparse Cattail. Other inclusions of this ecosite may occur beyond view of the ROW, and maturity of cover may fluctuate to be more representative of deciduous or mixed swamp in some locations.

3.4.6 OA: Open Aquatic

This area is represented by the open water portions of the Pefferlaw Brook channel. No areas of aquatic vegetation were apparent at the time of assessment.

4 KEY NATURAL HERITAGE FEATURES ASSESSMENT

Based on the biophysical information collected during background information gathering, and the summarized existing conditions of the study area as described above, **Table 2** below identifies all

KNHFs (and KHF's) that are present (or potentially present) within the study area. RiverStone's rationale for identifying such features is provided in the sections that follow.

Table 2. Summary of the Assessment of Key Natural Heritage Features and Key Hydrologic Features within the Study Area.

Key Natural Heritage/Hydrologic Feature	Estimated Status of Natural Feature of Conservation Interest within the Subject property
Permanent & Intermittent Streams	<i>Present. See Section 4.1.</i>
Inland Lakes and Littoral Zones	<i>Absent. See Section 4.2.</i>
Seepage Areas and Springs	<i>Absent. See Section 4.3.</i>
Wetlands (Including PSWs)	<i>Present. See Section 4.4.</i>
Fish Habitat	<i>Present. See Section 4.1.</i>
Sand Barrens, Savannahs, Tallgrass Prairies, and Alvars	<i>Absent. See Section 4.5.</i>
Areas of Natural and Scientific Interest	<i>Absent. See Section 4.6.</i>
Significant Valleylands	<i>Present. See Section 4.7.</i>
Significant Woodlands	<i>Present. See Section 4.8.</i>
Habitat of Endangered and Threatened Species	<i>Potentially present. See Section 4.9.</i>
Significant Wildlife Habitat	<i>Potentially Present. See Section 4.10.</i>

Shaded rows denote KNHF/KHF's that are present or have the potential to be present within the study area.

4.1 Streams & Fish Habitat

Pefferlaw Brook represents the primary permanent watercourse within the study area. This watercourse represents a major landscape drainage feature, one of a few prominent catchments originating from the north slopes of the Oak Ridges Moraine and draining into southern Lake Simcoe. Pefferlaw Brook receives drainage from the Uxbridge Brook subwatershed approximately 500 m upstream from the study area. The total catchment area upstream from the study area measures approximately 350 km² (per Ontario Flow Assessment Tool).

The reach of Pefferlaw Brook traversing the study area is represented by a broad oxbow with a large swath of open riparian cover adjacent to the inside bank (west) and overhanging canopy cover along most of the outside bank (east). Channel morphology was assessed at a high level within the direct vicinity of the bridge and was consistent directly upstream and downstream of the crossing. The average channel width ranges from 10-15 m, with average depth of 0.5 m (ranging from 0.25-0.7 m) at the time of site visit. The banks are generally quite subtle, with an estimated bank full depth of 1-1.5 m. This reach is mostly represented by a continuous run with slow flow. A fallen tree on the south side of the bridge creates a back eddy along the eastern shoreline. A short section of riffle starts just before the southern side of the bridge and continues approximately five meters to the north of the bridge where some medium-sized boulders and wooden remnants of a previous structure divert flow. Substrate directly adjacent to and under the bridge is firmer, consisting of fine gravel with some boulders, wooden debris, and pockets of cobble, potentially associated with a previous structure. Outside of the bridge footprint, typical substrate is sand and muck with small patches of fallen branches and organic debris such as leaves with a sparse gravel component. A collection of boulders

immediately north of the bridge along the western shore creates a back eddy in this area. Minnow species were observed using this area during the Oct 12, 2023 site visit, likely due to overhead cover and slower moving water within this reach. Outside of the emergent vegetation located on the southwest bank, there is minimal aquatic vegetation.

According to the Pefferlaw River/Brook Subwatershed Plan (LSRCA 2012), 45 species of fish have been recorded in the system through various data collection points since 1930. The plan notes that most of the system is managed as a coldwater fishery; however, the main branch and eastern tributary downstream of Udora are a warmwater system based on thermal properties. On this basis, we expect that spring fisheries timing windows will need to be avoided per recommendation from Hannah Edwards, Management Biologist, Midhurst Aurora Owen Sound District, Ministry of Natural Resources and Forestry and address both warmwater and coldwater habitat considerations within the study area. Locally, warmwater fish communities, typified by key sunfish (Centrarchidae) species such as rock bass (*Ambloplites rupestris*), green sunfish (*Lepomis cyanellus*), pumpkinseed (*Lepomis gibbosus*), bluegill (*Lepomis macrochirus*), smallmouth bass (*Micropterus dolomieu*), largemouth bass (*Micropterus salmoides*) and black crappie (*Pomoxis nigromaculatus*) are expected to occur; however, additional cold and cool water species such as pike (*Esox lucius*), that are found within the system, may use habitat within the wetlands adjacent to the watercourse within the study area during periods of flooding. The areas of riffles with associated gravel substrate may provide transient habitat for salmonid species such as brook trout, (*Salvelinus fontinalis*), that are present in the cold-water areas of the system, during cooler periods or times of high water.

Additional clarification will be sought from LSRCA and MNR at the detailed design phase. Further discussion, including an assessment of potential impacts to fish habitat and the aquatic environment resulting from implementation of the preferred design, is provided in **Section 5**.

4.2 Lakes (and Littoral Zones)

No lakes were identified within the study area during RiverStone's on-site assessment or background information review. No further assessment undertaken.

4.3 Seepage Areas and Springs

RiverStone did not observe evidence of any groundwater emergence features directly within the ROW or adjacent portions of the study area that were visible from the ROW. It is assumed that, given the local topographic context, there is the potential for seepage areas and springs to occur within the broader study area; however, given that proposed works are focused specifically on the bridge footprint, such features are not considered relevant to this assessment. Moreover, if any groundwater emergence features are located within the surrounding landscape, there is no expectation that such features would be impacted or otherwise influenced by implementation of potential alternatives. No further assessment is provided with respect to seepage areas and springs.

4.4 Wetlands

There is a small area of wetland mapped as occurring within the study area as per provincial wetland mapping (see **Figure 1**). This small polygon is associated within an open area along the Pefferlaw Brook riparian zone. Mapped wetland within the study area is considered 'unevaluated'; there are no designated areas of provincially significant wetland (PSW) within the study area or the adjacent landscape. Based on a review of provincial mapping resources, the nearest PSW occurs ~700 m northeast of the study area.

As described in **Section 3.4**, on-site assessment verified two wetland ecosites within the study area, SWT2 and MAM2. These features are part of the complex of successional vegetation occurring within the direct riparian zone of Pefferlaw Creek and within the adjacent poorly defined valley corridor. The MAM2 ecosite is likely a product of general low elevation and periodic flooding on Pefferlaw Brook. The SWT2 ecosite appears to have formed in a subtle trough within an area of otherwise flat and poorly draining successional woodlands throughout the valley corridor. From an ecological perspective, neither ecosite appears to represent a high-functioning wetland feature, with no evidence of substantial standing water areas, organic materials accumulations, or other wetland-specific habitat structures. The MAM2 ecosite is likely functioning similar to adjoining areas of successional meadow, while the SWT2 ecosite would be expected to function similarly to the surrounding complex of successional woodland.

Further discussion, including an assessment of potential impacts to wetlands resulting from implementation of the potential alternatives, is provided in **Section 5**.

4.5 Sand Barrens, Savannahs, Tallgrass Prairies, and Alvars

No vegetation communities representing sand barrens, savannahs, tallgrass prairies, or alvars were identified within the study area during RiverStone's on-site assessment or background information review. No further assessment undertaken.

4.6 Areas of Natural and Scientific Interest (Life Science)

It is the responsibility of the MNRF to designate and administer mapping for ANSIs. Based on available background mapping, the nearest life science ANSI is located >1 km west of the study area (**Figure 1**). No further assessment undertaken.

4.7 Significant Valleylands

Significant valleylands represent valleys or other landform depressions with recognized significant attributes, such as supporting natural vegetation cover with associated ecological linkages and corridors. Designation of significant valleylands is ultimately the responsibility of the relevant planning authority; however, site-specific designation of these feature can be undertaken using standardized provincial criteria provided by the province and/or the planning authority. In this case, there does not appear to be an existing designation in the OPs of either the Town or Region that specifically identifies valleylands associated with the study area as significant.

Technical guidelines of the Greenbelt Plan define valleylands as follows:

“Significant valleylands include any of the features identified in any of the following three categories:

- *all streams with well-defined valley morphology (i.e. floodplains, riparian zones, meander belts and/or valley slopes) of an average width of 25 metres or more; the physical boundary is defined by the stable top of bank (as defined by the conservation authority); or*
- *all spillways and ravines with the presence of flowing or standing water for a period of no less than two months in an average year. Such features must be greater than 50 metres in length; 25 metres in average width with a well-defined morphology (i.e. two valley walls of 15% slope or greater with a minimum height of 5 metres, and valley floor), and having an overall area of 0.5 ha or greater; or*

- *additional features beyond the ones described above that have been identified by the planning authority as providing one or more of the features or functions...”.*

Despite the prominence of Pefferlaw Brook on the local landscape, the stream corridor is not contained within a well-defined valley landform; however, it does support a floodplain, riparian zones, and meanderbelt. In terms of defining the discrete limits of the valleyland feature, the immediate landscape is consistently low-lying, without distinct elevation changes beyond the immediate top of bank, which generally occurs directly adjacent to the active channel. We provide the general opinion that the study area contains significant valleylands, the limits of which should generally be defined by the Pefferlaw Brook channel and associated hazard limits (e.g., floodplain, meanderbelt). **Appendix 1** provides the current limits of hazard features regulated by LSRCA, which may be used as a general guide for the limits of significant valleylands within the study area. Further discussion, including an assessment of potential impacts to the functions of significant valleylands resulting from implementation of the selected alternative, is provided in **Section 5**.

4.8 Significant Woodlands

Significant woodlands represent areas of forested cover with recognized significant attributes, such as large contiguous blocks of woodland or woodlands with unique composition or characteristics. Designation of significant woodland is ultimately the responsibility of the relevant planning authority; however, site-specific designation of these feature can be undertaken using standardized provincial criteria provided by the province and/or the planning authority.

Multiple technical criteria are available to assess woodland significance within the overlapping planning jurisdictions in which the study area is located. For example, the LSPP and Greenbelt Plan both provide criteria for assessing woodland significance within their respective plan coverage areas. The Regional OP also provides a set of specific criteria in this regard. In our opinion, the Region’s criteria are most applicable in this scenario as this is the most current document and the most specific from a jurisdictional perspective. The Regional OP criteria for significant woodland is as follows:

Section 3.4.30: That significant woodlands be verified on a site-by-site basis and shall include those woodlands meeting one of the following criteria:

- a. Is 0.5 hectares or larger and:

 - i. directly supports globally or provincially rare plants, animals or communities as assigned by the Natural Heritage Information Centre; or,*
 - ii. directly supports threatened or endangered species, with the exception of specimens deemed not requiring protection by the Province (e.g. as is sometimes the case with Butternut); or,*
 - iii. is within 30 metres of a provincially significant wetland or wetland including those identified on Map 4, waterbody, permanent stream or intermittent stream;**
- b. Is 2 hectares or larger and:

 - i. is located outside of the Urban Area, Towns and Villages, or Hamlets and is within 100 metres of a Life Science Area of Natural and Scientific Interest, a provincially significant wetland or wetland including those identified on Map 4, significant valleyland, or fish habitat; or,*
 - ii. occurs within the Regional Greenlands System;**

- c. Is south of the Oak Ridges Moraine and is 4 hectares or larger in size;*
- d. Is north of the Oak Ridges Moraine and is 10 hectares or larger in size;*
- e. On the Oak Ridges Moraine the woodland will be evaluated for significance based on the requirements of the Oak Ridges Moraine Conservation Plan and associated technical papers;
or,*
- f. On lands in the Greenbelt Natural Heritage System, the woodland will be evaluated for significance based on the requirements of the Greenbelt Plan and associated technical papers;
or,*
- g. On lands in the Lake Simcoe watershed, outside of the Greenbelt, the Oak Ridges Moraine Conservation Plan, and existing settlement areas, the woodland will be evaluated for significance based on the requirements of the Lake Simcoe Protection Plan and associated technical papers.*

Based on a review of the Regional OP criteria, essentially all woodland cover within the study area would be considered significant woodland insofar as satisfying criteria of subsections (a) and (b) above. Woodland patches within the study area generally exceed 2 ha in area and are located proximate to a watercourse, fish habitat, wetland, and are contained within an area that presumably represents significant valleyland. Further discussion, including an assessment of potential impacts to the functions of significant woodlands resulting from implementation of the selected alternative, is provided in **Section 5**.

4.9 Habitat of Endangered and Threatened Species

To assess the potential presence of individuals and/or habitat for endangered and threatened species within the study area, RiverStone staff conducted the following:

- Review the range maps for all species designated as endangered and threatened in Ontario, as per Schedules 2 and 3 of Ontario Regulation 230/08 [(Species at Risk in Ontario List (SARO List)], located here: <https://www.ontario.ca/laws/regulation/080230>. In our experience, the potential presence of most provincially endangered and/or threatened species can be ruled out based on their limited geographical ranges in the province and/or a lack of specific habitat conditions which they require to carry out key life processes.
- Reviewed the NHIC database for existing records of element occurrences for endangered or threatened species (data squares 17PK4302, 17PK4303, 17PK4402, 17PK4403). Databases of iNaturalist, OBBA, and ORAA were also reviewed as of Dec 2023.
- Sent email inquiry to MECP regarding any records of element occurrences for endangered/threatened species in the local area – response received with no additional information provided (see **Appendix 4**).
- On-site investigation undertaken in 2022, during which vegetation conditions were characterized for detailed habitat-based assessment.

Information from the above assessment process was used to inform a site-specific screening, as contained in **Appendix 4**. The screening is based on a list of species that are known to occur within the regional jurisdiction. Through this screening, the species discussed below were identified as having the

potential to be present within the subject property or directly adjacent lands. Where relevant, potential impacts to these species are discussed further in **Section 5**.

4.9.1 Endangered Bat Species (*Myotis lucifugus*, *Myotis septentrionalis*, *Perimyotis subflavus*)

These species, assessed as a species guild (related species with similar habitat characteristics), include several bat species listed as endangered in Ontario. Bats are highly mobile; however, individuals and groups of the noted bat species are also recognized as having some degree of fidelity to suitable local sites for daily and seasonal ‘roosting’ activities. While some species (*i.e.*, *Myotis lucifugus*) exhibit a preference for roosting in anthropogenic structures, natural roosting sites are also important. Natural roosting sites are generally associated with mature forests containing a sufficient density of large trees in various stages of decay, otherwise known as ‘snags’. Snags provide features such as cavities and/or loose bark, on which bats rely for shelter and thermoregulation throughout the active season.

Treed features within the study area are largely limited to successional/cultural woodland and maturing thicket cover. The predominant tree species is White Cedar, with dense canopies that are often not well suited to supporting roosting habitat. Associate hardwood cover includes trees that are generally small (averaging less than 20 cm diameter) and healthy, lacking mature trees and abundant decaying canopy components that would be suited to supporting cavity formation. In general, there is no expectation that the study area supports highly functional habitat for bats. On the contrary, the rural setting and presence of wetland and open-water areas means that the study area may be amenable to supporting foraging habitat for bats.

Current direction from MECP prescribes that targeted surveys of treed habitats/snags are not necessary to quantify the quality/extent of potential habitat for endangered bat species IF a project would involve removal of only a small number of potential maternity or day roost trees in treed habitats (or none at all). This approach assumes that other appropriate mitigation measures (*i.e.*, timing windows) are employed to avoid impacts to individuals of endangered bat species (MECP 2021). For the purpose of our assessment, it is RiverStone’s opinion that highly functional habitat features for endangered bat species are unlikely to occur within the study area and particularly within the ROW; however, it is not possible to rule out the potential for *individuals* of endangered bat species (or other bat species) to be present during the active season. Further discussion, including an assessment of potential impacts to individuals of endangered bat species resulting from implementation of the selected alternative, is provided in **Section 5**.

4.10 Significant Wildlife Habitat

Significant wildlife habitat (SWH) represents a range of habitat features that are recognized as providing specialized or otherwise important functions for various forms of wildlife. Designation of confirmed SWH is ultimately the responsibility of the relevant planning authority, and it is our understanding that no specific SWH designations have been applied to the study area. Notwithstanding, it is generally impractical for planning authorities to identify and designate most SWH features and functions on a comprehensive basis. Therefore, candidate SWH can be identified on a site-specific basis, often triggered through a large-scale development application.

To ensure due diligence in this regard, RiverStone has reviewed applicable technical guidance for the identification of specific SWH features and functions as contained in the SWH Criteria Schedules for Ecoregion 6E (MNR 2015). A preliminary assessment of the criteria schedules is contained within **Appendix 5**. The results of RiverStone’s field program and background review indicate that the

following SWH features/functions that have the potential to occur within the study area. A discussion of potential impacts to candidate SWH features and functions is provided in **Section 5**.

- Seasonal Concentration Areas of Animals
 - Bat Maternity Colonies
 - Deer Yarding Area
- Specialized Habitat for Wildlife
 - Breeding Amphibian Habitat (Wetland)
- Habitat of Species of Conservation Concern
 - Special Concern and Rare Wildlife Species
- Animal Movement Corridors
 - Amphibian Movement Corridors
 - Deer Movement Corridors

4.10.1 Bat Maternity Colonies

Refer to **Section 4.9.1** for discussion regarding the potential for bat maternity habitat to be present on or adjacent to the subject property. While the discussion in **Section 4.9.1** is provided specifically for endangered bat species, the assessment and conclusions are comparable to species that are not protected under the ESA.

4.10.2 Deer Yarding Area & Migratory Corridor

The study area is contained within an area mapped by the MNR as a Stratum 2 Deer Wintering Area. Stratum 2 'yards' are usually very broad-scale, covering large areas of the landscape where mixed forested cover is present. This is compared to Stratum 1 yards, which are considered the 'core' area of the yard that is most critical to supporting over-wintering deer. The Stratum 2 area that encompasses the study area measures over 50 km², and the study area is located along the southeastern edge of this mapped polygon (see **Figure 1**).

Despite the mapped Stratum 2 area, the study area likely provides only generic habitat function for White-tailed Deer. Several forest edges along the Pefferlaw River, roadways, and nearby residential areas likely detract from the overall value of the study area as deer wintering habitat.

4.10.3 Waterfowl Nesting Area

The Pefferlaw Brook corridor may support functional opportunities for waterfowl nesting. The availability of open water adjacent to mixed upland vegetation communities may support both ground-nesting and cavity-nesting waterfowl species. These habitat opportunities would most likely be associated with the open meadow/meadow marsh complex north of Concession Rd. 2 and any areas of woodland where tree cavities may be present.

4.10.4 Wetland Amphibian Breeding Habitat & Movement Corridor

Pefferlaw Brook riparian zones and floodplain features may support breeding habitat for one or more anuran species. Wetland communities observed during on-site investigations (as per **Figure 2**) do not appear to support abundant standing water that would be required to support significant breeding habitat. Notwithstanding, there is potential that floodplain pools or small open-water wetlands occur beyond view of the ROW that might support such functions.

4.10.5 Special Concern and Rare Wildlife Species

RiverStone staff have conducted a review of the list of species designated as special concern in Ontario, as per Schedule 4 of Ontario Regulation 230/08, located here:

<https://www.ontario.ca/laws/regulation/080230>. RiverStone further reviewed several biodiversity databases for existing records of element occurrences for special concern or rare species, including: NHIC, iNaturalist, OBBA, and ORAA. Through a review of background and on-site survey data, as well as application of staff knowledge and experience, RiverStone noted the following species as being potentially present within the study area:

- Barn Swallow (*Hirundo rustica*; Special Concern)
- Eastern Wood-Pewee (*Contopus virens*; Special Concern)
- Wood Thrush (*Hylocichla mustelina*; Special Concern)
- Snapping Turtle (*Chelydra serpentina*; Special Concern)

NHIC's database contains no record of element occurrence for Barn Swallow for the 1 km grid squares associated with the study area; however, individuals have been documented in the local area as per the OBBA database. This species is frequently observed foraging within agricultural settings and other open areas, while nesting often occurs under bridges or on the sides of agricultural buildings (*e.g.*, barns). A single nest was observed under the existing bridge that may have been created and/or used by a Barn Swallow. The ESA status of Barn Swallow was recently changed from threatened to special concern, meaning that regulated protections would no longer be afforded to this nest (should it have been used by a Barn Swallow).

Woodland bird species such as Eastern Wood-Pewee and Wood Thrush are commonly distributed in suitable woodland habitat across the local and regional landscape. While the NHIC database contains no records for either species, the OBBA has confirmed breeding records for both species for the broad 10x10 km grid square in which the study area is contained. The cedar-dominant woodlands within the study area would not provide preferred cover for either species; however, areas of mixed canopy may support some limited habitat functions.

NHIC's database contains a record of element occurrence of Snapping Turtle for one or more of the data squares overlapping the study area. This species is commonly encountered in streams and diverse wetland types, and it is highly likely that individuals would use Pefferlaw Brook to move between areas of key habitat. It is also possible that individuals may use local road shoulders for nesting; however, timing of site visits would make observations of former nests difficult. No areas of naturally-functional nesting habitat were observed within or adjacent to the ROW, and the watercourse is not suitably structured to support over-wintering functions.

5 IMPACT ASSESSMENT AND RECOMMENDATIONS

5.1 Proposed Activity

This EIS has been undertaken to inform a Municipal Class EA coordinated by Tatham Engineering to address identified deficiencies in the Old Shiloh Bridge crossing over Pefferlaw Brook. The existing structure is approximately 98 years old, with multiple rehabilitation works having been conducted in the past to address assessed deficiencies in the structure. The crossing is designed for single-lane traffic, that may be problematic as local traffic volumes grow. Notwithstanding these issues, the age of

the structure may bestow some historical/cultural significance that warrants consideration. The initial scope of this assessment involved characterization of natural heritage features and functions to inform selection of the various alternatives being contemplated, which included the following:

- 1) Do nothing;
- 2) Rehabilitate the existing bridge;
- 3) Remove and replace the bridge; and
- 4) Construct a new bridge adjacent to the existing bridge.

An updated assessment is provided herein to reflect selection of the preferred alternative, i.e., removal of the existing bridge and replacement with a two-lane structure (**Appendix 6**). While the preferred solution has been identified, detailed design of the bridge has not been undertaken to date. RiverStone has been circulated a preliminary concept drawing to inform a high-level assessment of potential impacts to identified features and functions. The recommendations provided within this report are preliminary and subject to change based on an evaluation of the detailed design. We note that additional future assessment may be warranted to inform requirements at detailed design stage.

5.2 Impact Assessment

As discussed in **Section 4**, multiple KNHF/KHFs have been confirmed or have the potential to occur in the study area. The preferred solution identified through the EA, i.e., remove and replace the bridge, has the potential to adversely impact one or more KNHF/KHFs through various pathways, including impacts related to the construction staging process, as well as long-term changes to the stream channel and associated areas of natural cover. The potential for negative impacts on all identified KNHF/KHFs is discussed in the sections below, and several recommendations are listed to support a scenario of no net negative impacts and/or appropriate authorizations where impacts cannot be avoided. **Table 3** provides a high-level summary of potential impacts and mitigation considerations.

In assessing and identifying potential negative impacts through a development process, it is important to highlight how the PPS defines negative impacts, i.e.:

“...degradation that threatens the health and integrity of the natural features or ecological functions for which an area is identified due to single, multiple or successive development or site alteration activities”

Importantly, as stated in Section 13.2 of the Natural Heritage Reference Manual (for Natural Heritage Policies of the PPS):

The PPS definition for “negative impacts” does not state that all impacts are negative, nor does it preclude the use of mitigation to prevent, modify or alleviate the impacts to the significant natural heritage feature or area”.

RiverStone’s impact assessment is intended to be reflective of the above guidance, with consideration for the integrity and function of each feature, and in acknowledgement that not all development and/or site alteration represents a negative impact to the natural environment. Moreover, in the context of the class EA process, it is important to highlight that infrastructure works undertaken as part of an EA are not considered development under the definitions of the PPS. Ultimately, RiverStone’s assessment is intended to inform a review of the above proposal by the appropriate approval authority. Our assessment is based on a review of existing conditions at the time of our site investigation.

5.2.1 Streams, Wetlands, & Fish Habitat

Through flood dynamics and general hydrologic connectivity, Pefferlaw Brook is inherently connected to adjacent wetland vegetation communities that occur within the study area. This complex of in-channel structure and associated vegetation cover are also critical to supporting fish and fish habitat, and so these features/functions are discussed together herein. In general, development and/or site alteration activities that occur proximate to streams, wetlands, and fish habitat have the potential to cause negative impacts via the following pathways:

- Alterations of surface water and/or groundwater contributions to streams and wetlands that may result from:
 - Construction staging and detour requirements (*e.g.*, dewatering, etc.);
 - Increased post-construction coverage of impervious surfaces (*e.g.*, roads, roofs, etc.); and,
 - Permanent modifications to existing topography or drainage;
- Increased sediment and/or nutrient loadings to features via runoff exiting the development area from construction to post-completion of the project. This may adversely affect water quality via increased turbidity, nutrient enrichment, contamination by toxic substances, changes in pH, changes in flow or thermal regimes etc.;
- Disruption or loss of habitat for fish and other wetland-dependent wildlife, as well as constructed-related impacts to such wildlife during the construction process; and,
- Increased human activity/encroachment within the stream or wetland post construction, which may result in increased soil compaction, dumping, vandalism, or other disturbances.

Depending on the design of the replacement bridge, some extent of encroachment into natural features is expected to be required. Replacement of the bridge with a wider footprint has the potential to alter or disturb the structure of the channel and banks, which has potential implications for areas of associated fish habitat. To facilitate construction, removal of trees, boulders, and submerged woody debris is expected to be required, resulting in a loss of overhanging vegetation and a change to existing in-stream structure. These features provide shade and important habitat for fishes within this system where such structure may otherwise be lacking. Multiple fish species were observed using the eddies on the northwest bank of the brook, providing an area of habitat that is supported by in-stream boulders and overhanging vegetation. Removal of the boulders, cobble, and submerged woody debris in a system comprised primarily of sand substrates has the potential to alter flow regimes in the immediate area of the structure, both above and downstream of the immediate footprint. Such changes may impact keystone warm water Sunfish species and other species that occupy this reach of the Pefferlaw Brook. Mitigation is warranted to avoid net negative impacts in this regard, including consideration for post-construction replacement and enhancement of in-stream habitat structure and re-vegetation of riparian zones.

Based on the preliminary design provided by Tatham Engineering, it is expected that minor encroachment into areas of riparian wetland will likely be required to facilitate installation of new wing walls and conceptual 2:1 graded slopes from the widened road bed. It is estimated that such wetland encroachment would be limited to the area southwest of the crossing, with potential encroachment into the feature amounting to an estimated 100-200 m², depending on the extent of grading and construction staging requirements in this location. Based on the location and nature of observed wetland ecosites, there is no expectation that this minor encroachment would negatively

impact functions of the broader riparian wetland complex. Observed wetlands are generic in nature, without any obvious sensitive habitat functions or specialized structure, e.g., floodplain pools, sensitive species assemblages. These communities intergrade with the disturbed, cultural vegetation that occurs within the direct road shoulder, which is where construction disturbance would be most concentrated.

In general, it is expected that most potential impacts to the watercourse, wetlands, and fish habitat would be related to construction processes, while changes in substrate composition and flow regime may result from the infrastructure itself. This could include potential destabilization of banks, release of sediment, potential contamination via fuel spills, and temporary blockage of fish passage. Such disturbances present a risk to sensitive aquatic communities and, most importantly, have the potential to result in harmful alteration, disruption, and destruction (HADD) of fish habitat. The federal *Fisheries Act* prohibits activities that cause the death of fish or HADD of fish habitat, so measures must be implemented to mitigate such potential outcomes.

Until further information is available regarding design details for the bridge, expected mitigation requirements are provided as follows to cover all potential impacts to the watercourse, fish habitat, and wetlands.

- **Prepare and submit a request for project review to the Department of Fisheries and Oceans (DFO) and adhere to all requirements of DFO in project planning and implementation.**
- **Consult with LSRCA regarding any requirements for regulated feature offsetting/compensation related to minor encroachment into wetlands as applicable.**
- **Activities and works in water must be designed and planned such that loss or disturbance to aquatic habitat is minimized as applicable.**
- **All in-water work must be isolated and completed in 'dry' conditions, with work area dewatered as applicable.**
- **Fish salvage must be undertaken prior to any de-watering of stream areas and following any work area flooding. Permits must be obtained from MNRFP prior to fish salvage as applicable.**
- **Prepare a post-construction stabilization and restoration plan for any new surfaces, embankments, or areas otherwise directly disturbed by construction staging. Apply a restoration seed mix composed of native species only (except for stabilizing cover crop).**
- **Minimize riverbank and bed hardening to the extent possible (if replacement structures are required, these should be designed to maintain the existing natural substrates and gradients and allows continued fish passage, i.e., open bottom).**
- **Minimize removal of overhanging vegetation to the extent possible.**
- **Avoidance disturbance to submerged boulders and woody debris material outside of the bridge development footprint and consider opportunities to replace in-stream fish habitat structure post-construction as applicable.**
- **Restore natural bed substrates within and adjacent to replaced crossing structures following construction as applicable.**

- **In-water works (if required) and diversion of flows should avoid spring fisheries timing windows from March 15th-July 15th. Timing windows should be confirmed with MNRF and/or LSRCA as applicable.**
- **Implement sediment and erosion control measures as per applicable best management practices to isolate the development footprint.**
 - **Sediment fencing must be constructed of heavy material and solid posts and be properly installed (trenched in) to maintain its integrity during inclement weather events.**
 - **Additional sediment fencing and appropriate control measures must be available on site so that any breach can be immediately repaired.**
 - **Regular inspection and monitoring will be necessary to ensure that the structural integrity and continued functioning of the sediment control measures is maintained (i.e., proper installation is not the only action necessary to satisfy the mitigation requirements).**
 - **An on-site supervisor should be responsible for daily inspections of the sediment and erosion control measures during construction activity and record the time and date of inspections, the status of the mitigation measures, and any repairs undertaken.**
 - **Removal of non-biodegradable erosion and sediment control materials should occur once construction is complete, and the site is stabilized.**
- **Best Management practices should be utilized with all machinery and fill being imported to the subject property to ensure that material and tracks are free from invasive species (*Phragmites australis*, etc.).**
- **Machinery should arrive on site in clean condition and is to be checked and maintained free of fluid leaks.**
- **Machinery must be refueled, washed, and serviced within the area isolated by sediment fencing, a minimum of 30 m from wetlands and the top of watercourse bank.**
- **Locate all fuel and other potentially deleterious substances within the area isolated by sediment fencing, a minimum of 30 m from wetlands and the top of watercourse bank.**
- **Temporary storage locations of aggregate/fill material (where required) should be located within the area isolated by sediment fencing. Storage areas should be sited to the west of Pepperlaw Brook. This material is to be contained by heavy-duty sediment fencing, a minimum of 30 m from wetlands and the top of watercourse bank as applicable.**
- **Offloading of construction and aggregate/fill materials (where required) should be completed during fair weather conditions, a minimum of 30 m from wetlands and the top of watercourse bank as applicable.**
- **All stockpiled topsoil/overburden (where required) should be piled in low piles and stabilized as quickly as possible (e.g., erosion-prone areas covered with textile) to minimize the potential for runoff and wind erosion as applicable.**

5.2.2 Significant Valleylands

Despite the lack of well-defined valley topography on the local landscape, the study area is contained within an area that may constitute significant valleylands. Pefferlaw Brook and its associated riparian zone and broader hazard limits (*e.g.*, floodplain, meanderbelt) can be considered the defining limits for the valleyland feature. Measuring ecological impacts to significant valleylands may be difficult as these features are generally represented by physical landforms that support a composite of other natural heritage features, such as woodlands, watercourses, wildlife habitat, etc.

The primary ecological functions associated with valleylands within the study area would be related to the conveyance of the associated watercourse feature, the provision of natural vegetation communities and wildlife habitats, and the continuity of natural cover that supports wildlife movement corridors. While the selected alternative would increase the built footprint associated with the bridge crossing, there is no expectation that this would negatively impact existing functions associated with the valleylands. Any site alteration would be concentrated within or adjacent to the existing built roadway, in a similar, albeit slightly wider, footprint. Post-construction, the proposed development will not result in change to the physical landform of the valley feature which, as noted, is not well defined in this specific location. Mitigation measures recommended elsewhere in this report are sufficient to ensure that the various features and functions associated with local valleylands are protected during and after potential site alteration activities.

5.2.3 Significant Woodlands

Woodland coverage is abundant within the study area and the broader landscape. Woodland communities observed from the ROW appear to be primarily successional in nature and not composed of mature trees or conservative plant assemblages. Regardless, these woodlands may be considered significant due to their size, continuity, and provision of habitat linkage functions. Impacts to woodland features from development activities are typically a result of the removal of large swaths of canopy cover. This can result in the direct loss of habitat functions through removal of unique features (*e.g.*, cavity trees), fragmentation of movement corridors, or reduction in amount of available interior woodland habitat.

Based on a preliminary design for the bridge replacement, it is likely that a small number of individual trees would be removed within the ROW to facilitate the project. Any potential tree removals would typically be identified through a Tree Inventory and Preservation Plan (TIPP) that assesses a specific design and grading plan. If any removals are determined to be required, we expect that these would be very minor and limited to individual trees around the structure footprint and within the ROW to the east of the structure.

Regardless of potential minor tree removals, most trees within the ROW are successional species that would be expected to quickly regenerate in appropriate locations following disturbance. Importantly, any minor removal of trees along the ROW would not result in a measurable reduction in the total area of contiguous woodland on the local landscape. There will also be no loss of habitat connectivity or interior woodland area, as the study area is situated along an existing functional woodland edge (roadway and stream corridor). In general, there is no expectation that the selected alternative would result in a negative impact to function and integrity of woodland features.

Regarding potential authorizations for works within significant woodlands, **Section 5.2.4** below discusses mitigation related to habitat for endangered and threatened species (*i.e.*, bats) that may be associated with woodland cover. It is our understanding that authorizations from the LSRCA would

not be required for trees removals within the ROW, but may be required for removal of stumps, grubbing, grading, etc. within regulated areas. Additional recommendations with respect to mitigation of woodland impacts are provided below.

- **Minimize vegetation removal and disturbance to the extent possible, particularly adjacent to the watercourse.**
- **Prepare a TIPP to determine the extent of potential tree removals following bridge design. Construction exclusion, staging, and tree protection measures should be included in the TIPP for mitigation planning.**
- **Following preparation of the TIPP, review opportunities for re-planting of trees that require removal as applicable.**

5.2.4 Habitat of Endangered and Threatened Species

Of those species screened and discussed in **Section 4.9**, it is expected that the study area may support habitat or individuals for only one species/guild, endangered bat species. Areas of identified habitat for any endangered or threatened species are protected from destruction as per Section 10 of the ESA. Potential habitat cover for bats is generally ubiquitous within forested landscapes and, while the study area may not be expected to represent *significant* habitat for endangered bat species, the area may be expected to support some level of seasonal activity. Importantly, individuals of endangered bat species cannot legally be killed, harmed, or harassed as per Section 9 of Ontario's Endangered Species Act (ESA). RiverStone recommends that the project demonstrate best efforts to ensure that individuals of endangered bat species are not killed, harmed, or harassed through the development process (should they be present). To accomplish, the following is recommended:

- **Any minor tree removals required to accommodate the bridge replacement design must be completed outside of the season in which endangered bats may be active, *i.e.*, April – Oct, inclusive. If substantial tree removals are determined to be required (*i.e.*, beyond the ROW), additional assessment of habitat usage and significance may be warranted as applicable.**

5.2.5 Significant Wildlife Habitat

Section 4.10 identified a list of candidate SWH features and functions that have the potential to occur within or adjacent to the study area, based on our assessment of the SWH Criteria Schedules for Ecoregion 6E (**Appendix 4**). These include:

- Bat Maternity Colonies
- Deer Wintering Areas/Movement Corridor
- Waterfowl Nesting Areas
- Wetland Amphibian Breeding Habitat/Movement Corridor
- Habitat for Special Concern and Rare Wildlife Species
 - Barn Swallow
 - Eastern Wood-Pewee
 - Wood Thrush
 - Snapping Turtle

Given the scope and scale of the proposed works, there is no expectation that the study area would be impacted in a manner that would prevent the long-term continuation of any of the above-noted

candidate SWH features and functions (should they occur). All these functions depend on the retention of existing vegetation communities, including wetlands and woodlands. It is expected that the selected alternative will result in minor encroachment into one wetland community and potential removal of individual trees within the ROW. In general, it is recommended that the bridge design review opportunities for avoiding the small riparian meadow marsh within the ROW southwest of the existing crossing, or at least minimizing the footprint of encroachment. Similarly, trees should be inventoried within the ROW and the results reviewed to maximize retention of existing vegetation as feasible.

Construction activities have the potential to cause short-term disruption to candidate SWH features/functions, with mitigation planning being an important step to minimize and avoid such impacts. Regarding bat maternity colonies, discussion provided in **Section 5.2.4** pertaining to endangered bat species is considered directly relevant herein. Other important measures pertaining to vegetation disturbance and construction timing windows are listed below to avoid any incidental harm to various wildlife species, including those listed above. If all mitigation measures recommended in this report are implemented, there is no expectation that implementation of the preferred alternative will result in net negative impacts to candidate SWH features and functions.

- **Work site isolation must utilize sediment and erosion control that represents suitable wildlife exclusion fencing as per best management practises endorsed by the MECP.**
- **If any individual turtles are encountered within works area, activities that have the potential to harm such individuals should stop immediately. A qualified biologist or MECP should then be contacted to determine the most appropriate mitigation measure.**

5.2.6 General Impact Assessment and Mitigation

It is RiverStone's preliminary opinion that the selected alternative can be accomplished without significant adverse impacts to the functions of identified KNHF/KHFs. Importantly, the option to replace the bridge avoids the need for continued rehabilitation works, which can be impactful on the natural environment on an ongoing basis. Regardless, the option to remove and replace the bridge will inherently result in some short-term disturbance within the ROW, including temporary construction disturbance, with the following general mitigation recommended in addition to those listed in previous sections.

- **Grading and other activities that cause disturbance outside of the development envelope should be minimized to the extent possible during the construction period.**
- **In the spring prior to construction, install temporary bird exclusion mesh underneath bridges to prevent establishment of nests within the season of construction.**
- **Clearing of vegetation must be restricted to times outside of the period April 15 to October 30. If development and site alteration must occur within the period of April 1 to Aug 30, a nest survey should be conducted by a qualified avian biologist prior to commencement of construction activities to identify and locate active nests of migratory bird species covered by the MBCA. If a nest is located or evidence of breeding noted, then a mitigation plan should be developed to address any potential impacts on migratory birds or their active nests. Mitigation may require establishing appropriate buffers around active nests or delaying construction activities until the conclusion of the nesting season. If any clearing of mature trees must occur within the period April 15 to Oct 30, further measures may need to be taken with respect to mitigating harm to endangered bats which have the potential occur on site as applicable.**

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Table 3. Summary of Potential Impacts Resulting from Selected Alternative.

Feature	Alternative Option 3 (Selected Alternative) – Remove and Replace Bridge; Widen to Two Lanes
Streams and Fish Habitat	<p>Impacts: Potential impacts related to pollution from construction equipment spills, sediment release from excavation works; de-stabilization of banks; potential in-water construction staging. Potential direct impacts to fish habitat, depending on in water footprints and changes in substrate and flow regimes.</p> <p>Mitigation: Construction best management practises for work-site isolation and re-fueling; sediment and erosion controls measures; bank stabilization measures; adherence to in-water timing windows, minimization of riverbank and bed hardening.</p> <p>Authorizations: Submission to DFO; permit application to LSRCA.</p>
Wetlands	<p>Impacts: Potential impacts related to pollution from construction equipment spills; sediment release from excavation works; potential minor wetland encroachment to accommodate widening.</p> <p>Mitigation: Construction best management practises for work-site isolation and re-fueling; sediment and erosion controls measures; potential restoration/offsetting measures.</p> <p>Authorizations: Permit application to LSRCA.</p>
Significant Valleylands	<p>Impacts: Potential de-stabilization of banks; no expected impacts to valley form and function.</p> <p>Mitigation: Post-construction bank stabilization measures.</p>
Significant Woodlands	<p>Impacts: Potential minor tree removals within ROW.</p> <p>Mitigation: Prepare Tree Inventory and Preservation Plan to determine extent of tree removals; potential restoration/offsetting measures.</p>
Habitat of Threatened and Endangered Species	<p>Impacts: Potential minor tree removals within ROW.</p> <p>Mitigation: Confirm absence of SAR trees; conduct removals during appropriate timing window to avoid incidental impacts to SAR bats.</p> <p>Authorizations: None expected; potential if SAR identified or if tree removal timing windows cannot be met.</p>
Significant Wildlife Habitat	<p>Impacts: Potential minor tree removals within ROW; disturbance to wildlife habitat functions during active season; disruption to wildlife movements during active season.</p> <p>Mitigation: Conduct any tree removals during appropriate timing window to avoid wildlife disturbance and incidental impacts to SAR bats; isolate work area to avoid wildlife access; consolidate work area as feasible to minimize disruption of seasonal movements.</p>
Impact Summary	<p>This alternative poses some minor impacts related to an overall expansion of footprint for the bridge and roadway approach, including potential minor tree removals and minor encroachment into a small riparian wetland area. In general, impacts are expected to be low and easily mitigated.</p>

6 PERMITTING & APPROVALS CONSIDERATIONS

Multiple approvals and/or permits may be required to facilitate the proposed works, including:

- **Fisheries Act:** A request for review under the Federal *Fisheries Act* is expected to be required to ensure that the project is consistent with the Act.
- **Endangered Species Act:** Based on the results of RiverStone's detailed EIS herein, there is minimal potential for individuals or habitat for endangered or threatened species to occur within the project area. Based on our understanding of the project, and assuming full implementation of mitigation measures recommended herein, there is no expectation that works will result in a contravention of the ESA. At this time, it is not expected that permits/approvals are required under the ESA to permit the works to proceed.
- **Conservation Authorities Act:** In addition to the above, the study area is located within the Lake Simcoe Region Conservation Authority's regulatory jurisdiction. A permit or other authorization is expected to be required from the Conservation Authority under O. Reg. 179/06 to allow the bridge works to proceed.
- **Migratory Birds Convention Act:** Mitigation measures have been provided to ensure that works will not result in a contravention to the MBCA. No specific permits are required in this regard.

7 SUMMARY & CONCLUSIONS

The preceding report provides the results of RiverStone's assessment of natural heritage features and functions associated with a watercourse crossing in the Town of the Georgina. Alternatives for potential replacement or rehabilitation of this structure have been considered, with replacement and widening of the bridge identified as the preferred solution. Our report characterizes natural heritage features and constraints associated with a defined study area and provides an assessment of potential impacts to aid in further design. The report provides general mitigation planning that can be used to identify additional required measures to support implementation of the project. Pending review by appropriate authorities, further investigations of the study area may be required to assess potential natural heritage impacts associated with the project. Authorizations from one or more agencies are required to ensure compliance with environmental policies and regulations.

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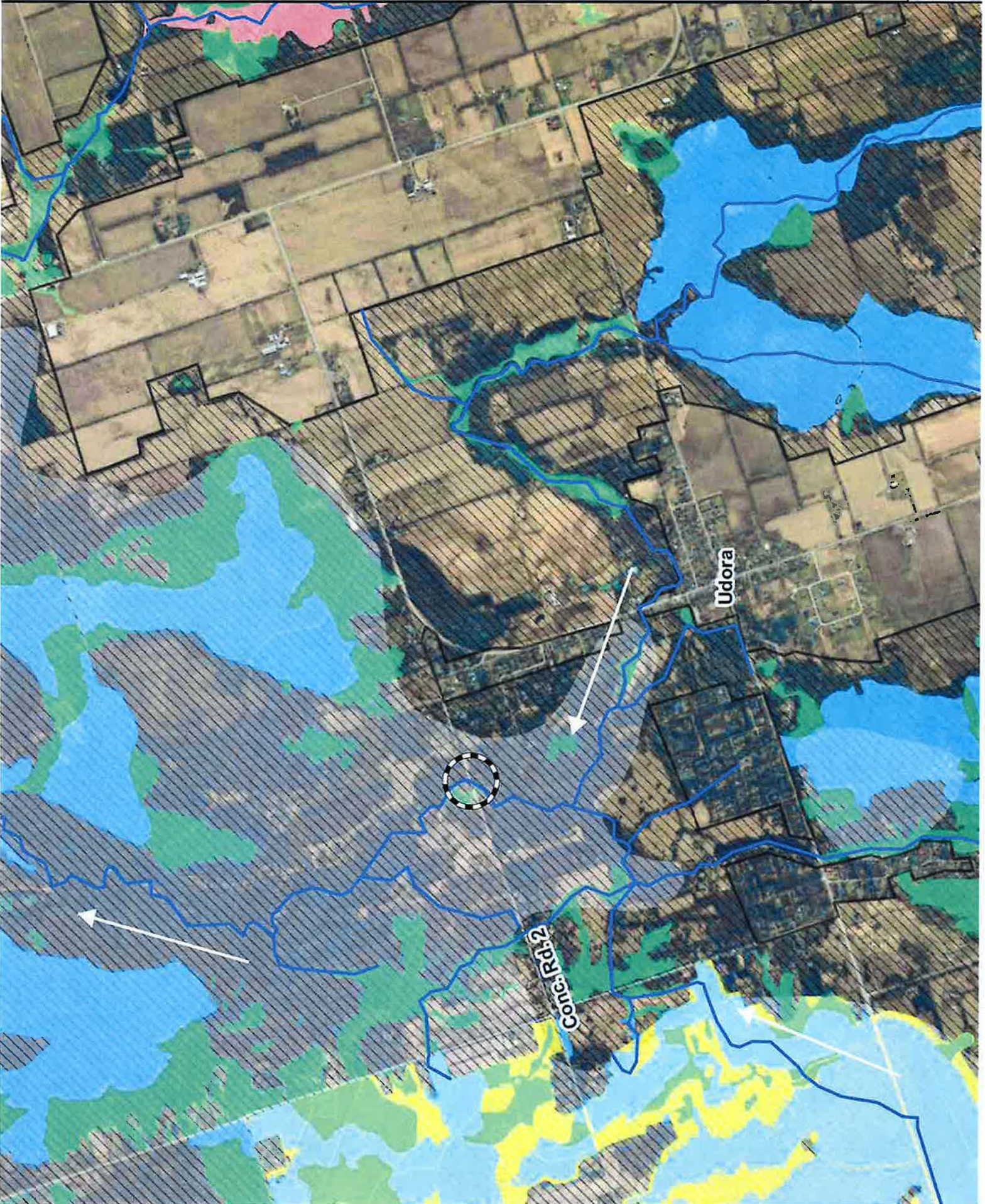
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Figure 1
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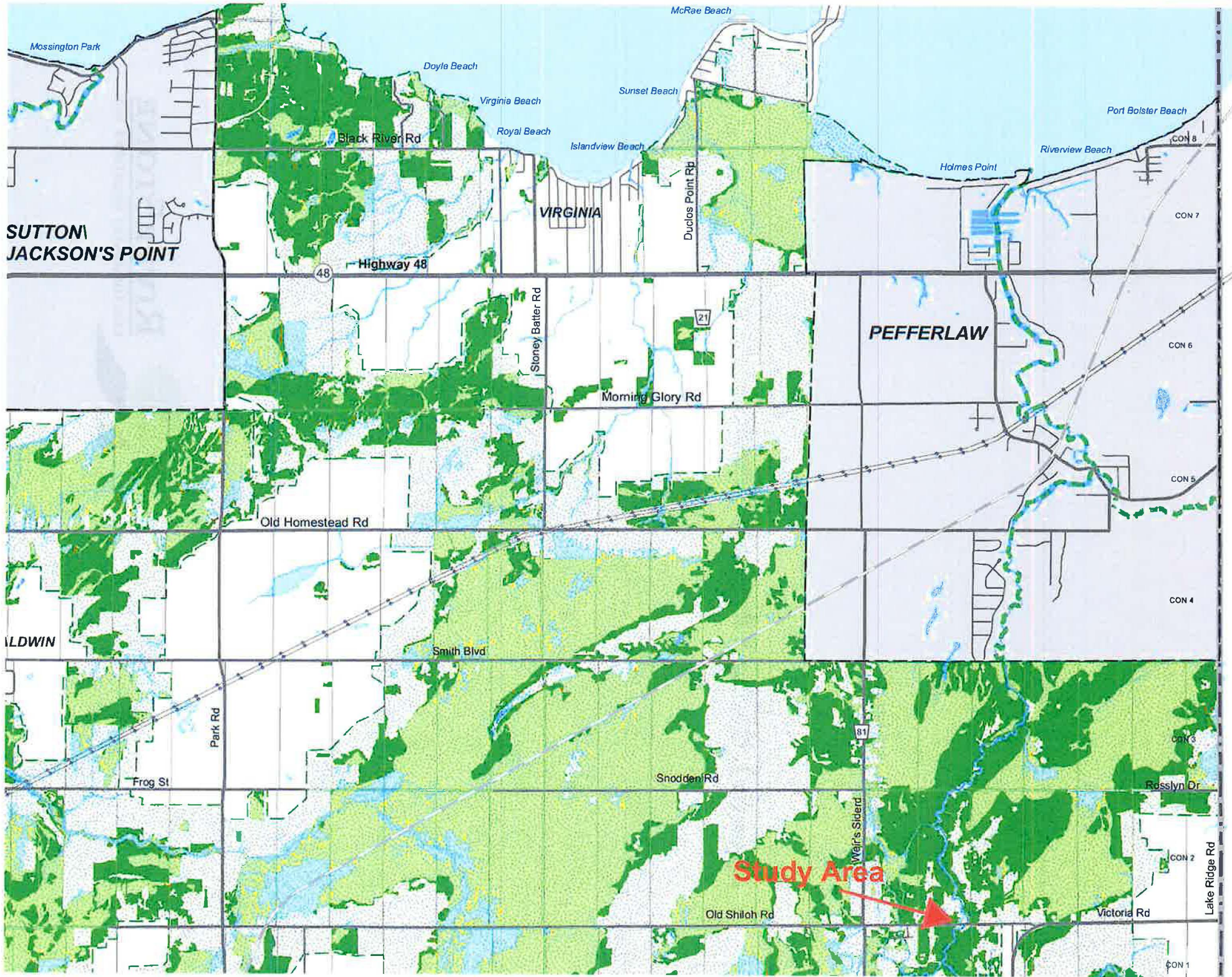


Figure 2
'Old Shick
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Appendix 1. Planning & Regulatory Schedules.



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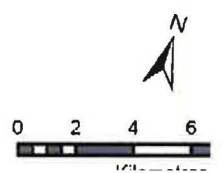


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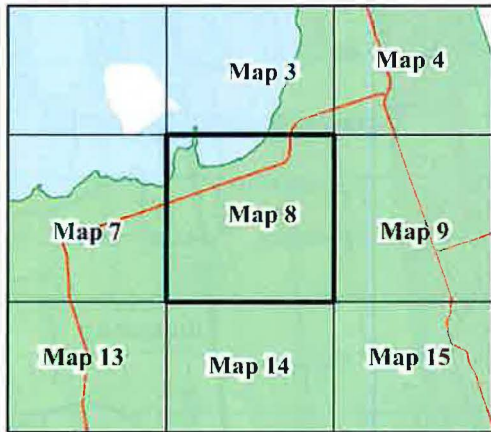
Study Area

Region of Durham

of Simcoe



greenbelt



LEGEND



- Greenbelt Area*
- Protected Countryside
- Natural Heritage System
- Towns / Villages
- Urban River Valleys
- Niagara Escarpment Plan Area
- Oak Ridges Moraine Area
- External Connections
- Settlement Areas Outside the Greenbelt
- Upper Tier Municipal Boundaries
- Lower & Single Tier Municipal Boundaries
- Lots and Concessions
- Major Road or Highway
- Minor Road
- First Nations

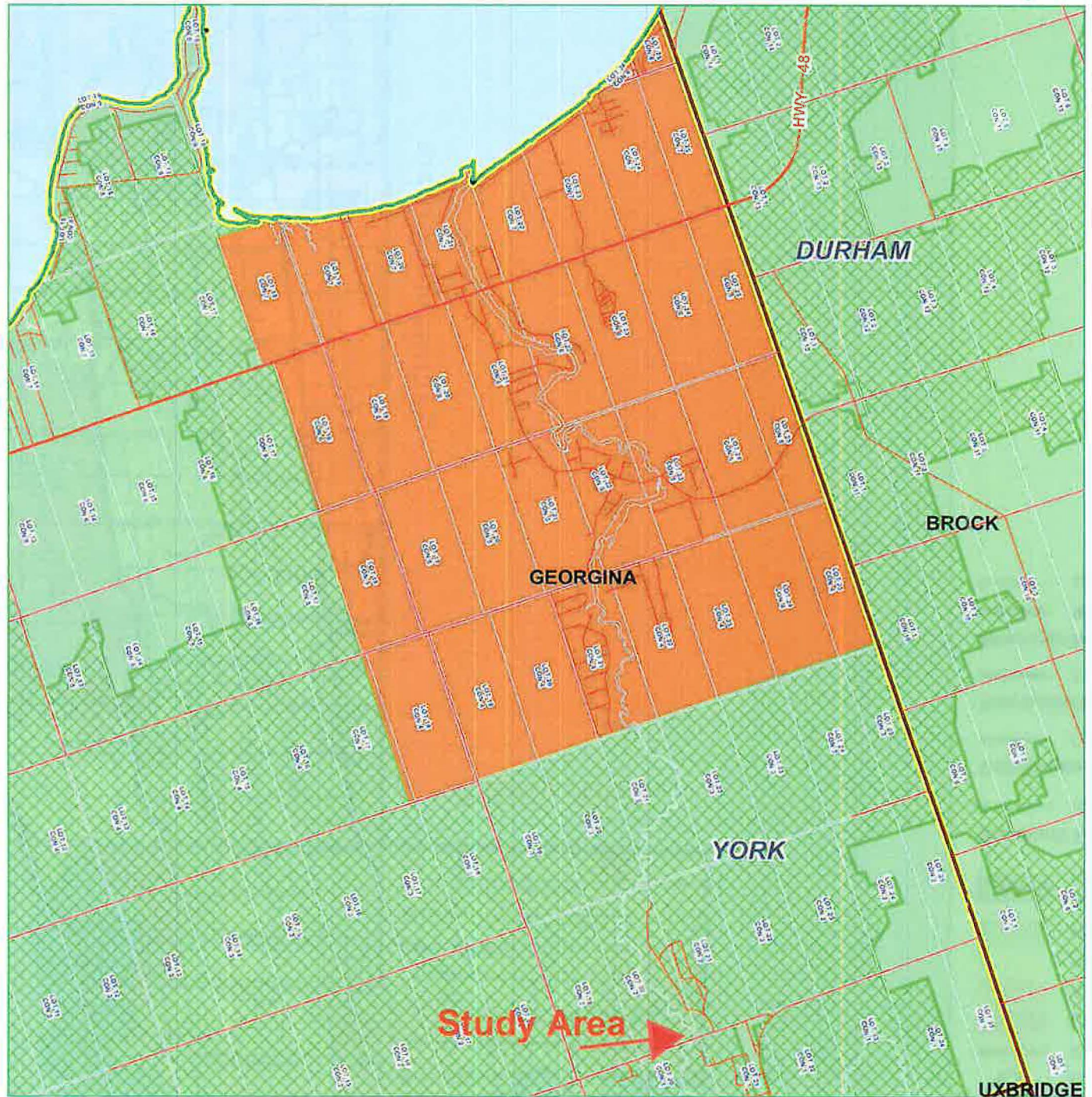
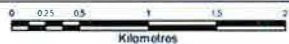
The information displayed on this map has been compiled from various sources. While every effort has been made to accurately depict the information, this map should not be relied on as being a precise indicator of locations of features or roads nor as a guide to navigation.

Settlement boundaries generally reflect information provided by the relevant municipality. For precise boundaries and locations of Settlement Areas (Greenbelt Towns/Villages and Hamlets) the appropriate municipalities should be consulted.

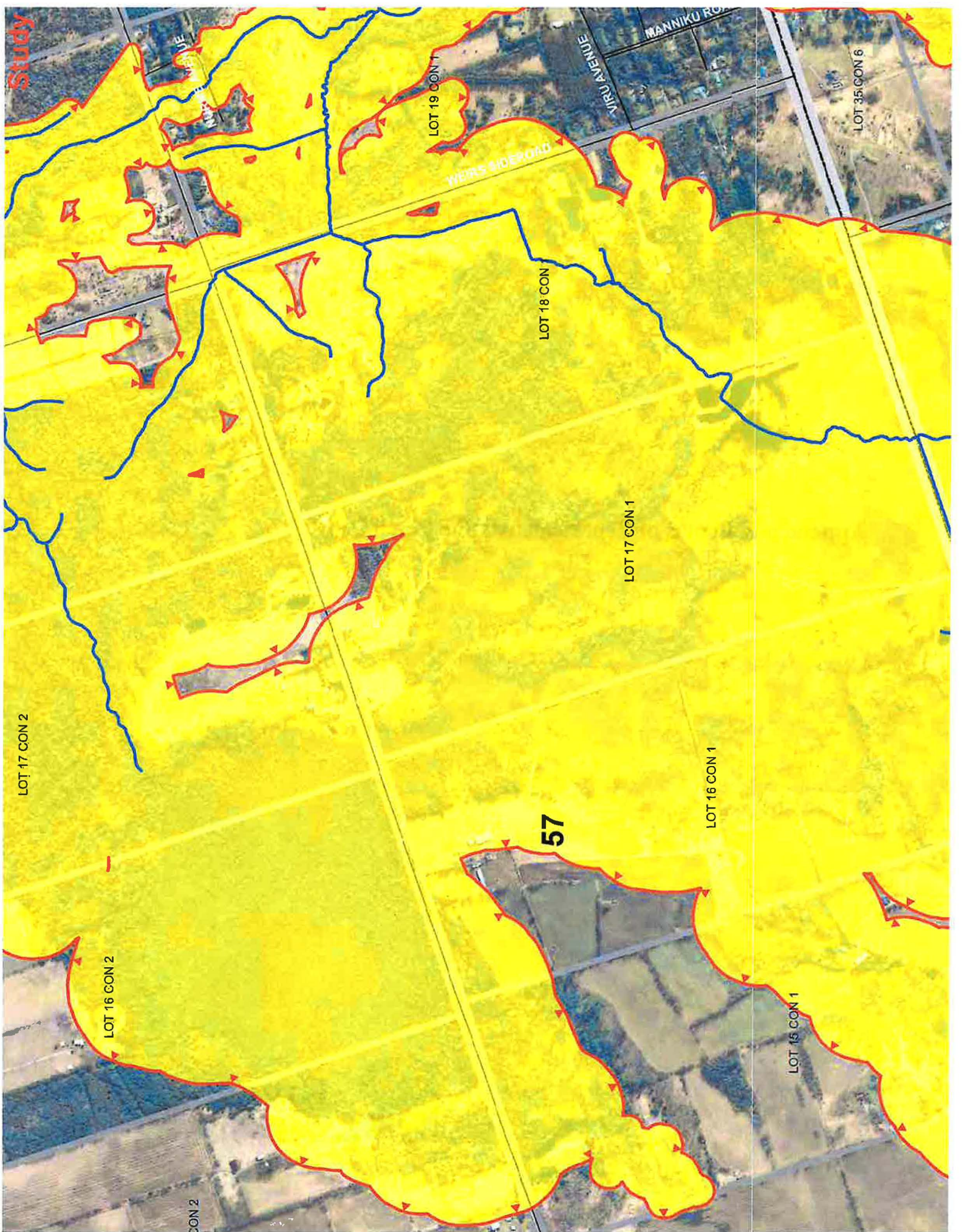
Source of Information:
Produced by and using data sources from the Ministry of Municipal Affairs, Ministry of Natural Resources and Forestry and the Ministry of Agriculture, Food and Rural Affairs.

Projection: UTM Zone 17 NAD83
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* Ontario Regulation 59/05, as amended.



UXBRIDGE



Appendix 2. Photos of Representative Site Conditions.





Photo 1. Facing east towards crossing.



Photo 2. Facing southeast from west of crossing; riparian vegetation.



Photo 3. Facing north from west of crossing; riparian vegetation and open cultural meadow.



Photo 4. Facing east along south side bridge.



Photo 5. Facing south from bridge; riparian vegetation and successional woodlands.



Photo 6. Facing northeast from underneath bridge.



Photo 7. Facing west underneath bridge.



Photo 8. Facing north (downstream) from underneath bridge.



Photo 9. Substrates consisting of cobble, gravel, and sand directly adjacent to the bridge on the south side of the bridge.



Photo 10. Facing east from east side of bridge.



Photo 11. Facing south from southern edge of road allowance, east of bridge; Buckthorn thicket and Cedar woodlands.



Photo 12. Facing west from bridge; riparian vegetation and successional woodlands.



Photo 13. Facing southeast from east side of bridge; mixed successional woodlands with wetland thickets.



Photo 14. Facing east from east side of bridge.



Photo 15. Facing south from southern edge of road allowance, east of bridge; Buckthorn thicket and Cedar woodlands.



Photo 16. Facing north from southeast of bridge; typical Cedar woodlands along shallow valley slopes.

Appendix 3. Background Natural Heritage Data.



NHIC Data

To work further with this data select the content and copy it into your own word or excel documents.

OGF ID	Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	ATLAS NAD83 IDENT	COMMENTS
1034267	SPECIES	Bobolink	Dolichonyx oryzivorus		THR	THR	17PK4303	
1034266	NATURAL AREA	Zephyr Creek Swamp					17PK4302	
1034266	NATURAL AREA	Zephyr-Egypt Wetland Complex					17PK4302	
1034266	SPECIES	Eastern Meadowlark	Sturnella magna		THR	THR	17PK4302	
1034266	SPECIES	Snapping Turtle	Chelydra serpentina		SC	SC	17PK4302	
1034277	NATURAL AREA	Lower Pefferlaw Brook Wetland Complex					17PK4403	
1034277	SPECIES	Bobolink	Dolichonyx oryzivorus		THR	THR	17PK4403	
1034276	SPECIES	Eastern Meadowlark	Sturnella magna		THR	THR	17PK4402	

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Atlas Data Summary

Select what type of data summary you would like to display and click the appropriate *view* button. You can use the [square resource page](#) to find out where your atlas squares or regions are located.

What years do you want to display :: all years combined Which version of the atlas

How do you want to view the results: Tabular results

Show me statistics on the number of species reported, the effort, etc.

1. View summary statistics:: Province
2. View summary statistics: By Square within region 1. Essex
3. View list of completed Point Counts in square ::

Show me the list of species, the highest breeding evidence and abundance

4. View species list for :: Province
5. View species list for square or block no. :: 17PK40

Show me the list of regions or squares reporting a species

6. View list of reporting

Species list for square 17PK40 (number of entries returned: 112)

Region	Square	Species	Breeding Evidence				Point Counts			
			Max BE	Categ	#Sq	Atlasser Name	#PC	%PC	Abun	#Sq
45	17PK40	Canada Goose	FY	CONF	1	2 atlassers	5	19.23	0.7692	1
45	17PK40	Wood Duck	P	PROB	1	Joanne Nonnekes				
45	17PK40	Mallard	T	PROB	1	Josh Shook				
45	17PK40	Hooded Merganser	FY	CONF	1	Joanne Nonnekes				
45	17PK40	Ruffed Grouse	T	PROB	1	Joanne Nonnekes				
45	17PK40	Wild Turkey	NU	CONF	1	Joanne Nonnekes				

Ontario Breeding Bird Atlas

45	17PK40	American Bittern	T	PROB	1	Joanne Nonnekes				
45	17PK40	Green Heron	T	PROB	1	Joanne Nonnekes				
45	17PK40	Turkey Vulture	H	POSS	1	Joanne Nonnekes				
45	17PK40	Osprey	NY	CONF	1	Joanne Nonnekes				
45	17PK40	Northern Harrier	P	PROB	1	Roy Smith				
45	17PK40	Sharp-shinned Hawk	CF	CONF	1	Josh Shook				
45	17PK40	Northern Goshawk	P	PROB	1	Joanne Nonnekes				
45	17PK40	Broad-winged Hawk	S	POSS	1	Joanne Nonnekes				
45	17PK40	Red-tailed Hawk	T	PROB	1	Joanne Nonnekes				
45	17PK40	American Kestrel	H	POSS	1	Joanne Nonnekes				
45	17PK40	Virginia Rail	FY	CONF	1	Josh Shook				
45	17PK40	Sora	T	PROB	1	Joanne Nonnekes				
45	17PK40	Killdeer	T	PROB	1	Joanne Nonnekes				
45	17PK40	Rock Pigeon	D	PROB	1	Joanne Nonnekes				
45	17PK40	Spotted Sandpiper	FY	CONF	1	Joanne Nonnekes				
45	17PK40	Upland Sandpiper	H	POSS	1	Rayfield Pye				
45	17PK40	Common Snipe	V	PROB	1	Josh Shook				
45	17PK40	American Woodcock	T	PROB	1	Joanne Nonnekes				
45	17PK40	Mourning Dove	FY	CONF	1	Joanne Nonnekes	6	23.08	0.3077	1
45	17PK40	Black/Yellow-billed Cuckoo	S	POSS	1	Josh Shook				
45	17PK40	Black-billed Cuckoo	H	POSS	1	Roy Smith				
45	17PK40	Eastern Screech-Owl	S	POSS	1	Joanne Nonnekes				
45	17PK40	Barred Owl	FY	CONF	1	Joanne Nonnekes				
45	17PK40	Chimney Swift	T	PROB	1	Joanne Nonnekes				
45	17PK40	Ruby-throated Hummingbird	S	POSS	1	Joanne Nonnekes				
45	17PK40	Belted Kingfisher	CF	CONF	1	Josh Shook				
45	17PK40	Yellow-bellied Sapsucker	NY	CONF	1	Joanne Nonnekes	1	3.85	0.0385	1
45	17PK40	Downy Woodpecker	T	PROB	1	Joanne Nonnekes				
45	17PK40	Hairy Woodpecker	FY	CONF	1	Joanne Nonnekes	1	3.85	0.0385	1
45	17PK40	Northern Flicker	P	PROB	1	Joanne Nonnekes				
45	17PK40	Pileated Woodpecker	T	PROB	1	Joanne Nonnekes				
45	17PK40	Eastern Wood-Pewee	T	PROB	1	Joanne Nonnekes	3	11.54	0.1154	1
45	17PK40	Acadian Flycatcher	S	POSS	1	Joanne Nonnekes				
45	17PK40	Alder Flycatcher	T	PROB	1	Joanne Nonnekes	2	7.69	0.1538	1
45	17PK40	Least Flycatcher	T	PROB	1	Joanne Nonnekes	2	7.69	0.0769	1
45	17PK40	Eastern Phoebe	NY	CONF	1	Joanne Nonnekes				
45	17PK40	Great Crested Flycatcher	T	PROB	1	Joanne Nonnekes	6	23.08	0.2692	1
45	17PK40	Eastern Kingbird	FY	CONF	1	Roy Smith	2	7.69	0.0769	1
45	17PK40	Yellow-throated Vireo	S	POSS	1	Joanne Nonnekes				
45	17PK40	Warbling Vireo	T	PROB	1	Joanne Nonnekes				
45	17PK40	Red-eyed Vireo	T	PROB	1	Joanne Nonnekes	8	30.77	0.4231	1
45	17PK40	Blue Jay	FY	CONF	1	Joanne Nonnekes	6	23.08	0.2308	1
45	17PK40	American Crow	CF	CONF	1	Josh Shook	17	65.38	1.1154	1
45	17PK40	Common Raven	H	POSS	1	Joanne Nonnekes				
45	17PK40	Horned Lark	T	PROB	1	Joanne Nonnekes				
45	17PK40	Purple Martin	S	POSS	1	Joanne Nonnekes				
45	17PK40	Tree Swallow	AE	CONF	1	Josh Shook	4	15.38	0.2308	1

Ontario Breeding Bird Atlas

45	17PK40	Northern Rough-winged Swallow	AE	CONF	1	Joanne Nonnekes				
45	17PK40	Cliff Swallow	NY	CONF	1	Joanne Nonnekes				
45	17PK40	Barn Swallow	NY	CONF	1	Joanne Nonnekes	2	7.69	0.1923	1
45	17PK40	Black-capped Chickadee	FY	CONF	1	Joanne Nonnekes	4	15.38	0.3077	1
45	17PK40	Red-breasted Nuthatch	T	PROB	1	Joanne Nonnekes				
45	17PK40	White-breasted Nuthatch	T	PROB	1	Joanne Nonnekes				
45	17PK40	Brown Creeper	T	PROB	1	Joanne Nonnekes				
45	17PK40	House Wren	NU	CONF	1	Geoff Carpentier	2	7.69	0.1154	1
45	17PK40	Winter Wren	S	POSS	1	Joanne Nonnekes				
45	17PK40	Blue-gray Gnatcatcher	P	PROB	1	Joanne Nonnekes				
45	17PK40	Eastern Bluebird	V	PROB	1	Joanne Nonnekes				
45	17PK40	Veery	T	PROB	1	Joanne Nonnekes	5	19.23	0.3846	1
45	17PK40	Hermit Thrush	S	POSS	1	Joanne Nonnekes				
45	17PK40	Wood Thrush	NY	CONF	1	Joanne Nonnekes	3	11.54	0.1154	1
45	17PK40	American Robin	NE	CONF	1		16	61.54	1.1923	1
45	17PK40	Gray Catbird	T	PROB	1	Joanne Nonnekes				
45	17PK40	Brown Thrasher	S	POSS	1	Joanne Nonnekes				
45	17PK40	European Starling	FY	CONF	1	Joanne Nonnekes	4	15.38	0.1923	1
45	17PK40	Cedar Waxwing	D	PROB	1	Joanne Nonnekes	3	11.54	0.3077	1
45	17PK40	Blue-winged/Golden-winged Warbler	S	POSS	1	Joanne Nonnekes				
45	17PK40	Nashville Warbler	T	PROB	1	Joanne Nonnekes				
45	17PK40	Yellow Warbler	NE	CONF	1	Joanne Nonnekes	8	30.77	0.4231	1
45	17PK40	Chestnut-sided Warbler	T	PROB	1	Joanne Nonnekes	2	7.69	0.0769	1
45	17PK40	Magnolia Warbler	T	PROB	1	Joanne Nonnekes				
45	17PK40	Black-throated Blue Warbler	T	PROB	1	Joanne Nonnekes	1	3.85	0.0385	1
45	17PK40	Yellow-rumped Warbler	P	PROB	1	Joanne Nonnekes	1	3.85	0.0385	1
45	17PK40	Black-throated Green Warbler	T	PROB	1	Joanne Nonnekes	1	3.85	0.0769	1
45	17PK40	Blackburnian Warbler	T	PROB	1	Joanne Nonnekes	1	3.85	0.0385	1
45	17PK40	Pine Warbler	T	PROB	1	Joanne Nonnekes				
45	17PK40	Black-and-white Warbler	T	PROB	1	Joanne Nonnekes	3	11.54	0.1154	1
45	17PK40	American Redstart	S	POSS	1	Joanne Nonnekes	1	3.85	0.0385	1
45	17PK40	Ovenbird	T	PROB	1	Joanne Nonnekes	11	42.31	0.8462	1
45	17PK40	Northern Waterthrush	T	PROB	1	Joanne Nonnekes	6	23.08	0.3846	1
45	17PK40	Mourning Warbler	T	PROB	1	Joanne Nonnekes	1	3.85	0.0385	1
45	17PK40	Common Yellowthroat	CF	CONF	1	Roy Smith	6	23.08	0.4231	1
45	17PK40	Canada Warbler	T	PROB	1	Joanne Nonnekes				
45	17PK40	Eastern Towhee	S	POSS	1	Joanne Nonnekes				
45	17PK40	Chipping Sparrow	CF	CONF	1	Josh Shook	1	3.85	0.0385	1
45	17PK40	Field Sparrow	T	PROB	1	Joanne Nonnekes	1	3.85	0.0385	1
45	17PK40	Vesper Sparrow	T	PROB	1	Joanne Nonnekes				
45	17PK40	Savannah Sparrow	A	PROB	1	Joanne Nonnekes	2	7.69	0.0769	1
45	17PK40	Grasshopper Sparrow	A	PROB	1	Rayfield Pye				
45	17PK40	Song Sparrow	CF	CONF	1	Joanne Nonnekes	12	46.15	0.6154	1
45	17PK40	Swamp Sparrow	CF	CONF	1	Joanne Nonnekes	3	11.54	0.1923	1
45	17PK40	White-throated Sparrow	A	PROB	1	Joanne Nonnekes	2	7.69	0.0769	1
45	17PK40	Scarlet Tanager	T	PROB	1	Joanne Nonnekes	2	7.69	0.0769	1
45	17PK40	Northern Cardinal	T	PROB	1	Joanne Nonnekes	1	3.85	0.0385	1

Ontario Breeding Bird Atlas

45	17PK40	Rose-breasted Grosbeak	T	PROB	1	Joanne Nonnekes	5	19.23	0.1923	1
45	17PK40	Indigo Bunting	T	PROB	1	Joanne Nonnekes	2	7.69	0.0769	1
45	17PK40	Bobolink	P	PROB	1	Joanne Nonnekes	2	7.69	0.1538	1
45	17PK40	Red-winged Blackbird	NY	CONF	1	Joanne Nonnekes	17	65.38	2.1923	1
45	17PK40	Eastern Meadowlark	A	PROB	1	Geoff Carpentier	1	3.85	0.0385	1
45	17PK40	Common Grackle	CF	CONF	1	Geoff Carpentier	5	19.23	0.3462	1
45	17PK40	Brown-headed Cowbird	FY	CONF	1	Roy Smith	3	11.54	0.1923	1
45	17PK40	Baltimore Oriole	AE	CONF	1	Josh Shook	7	26.92	0.2692	1
45	17PK40	Purple Finch	D	PROB	1	Roy Smith				
45	17PK40	House Finch	T	PROB	1	Joanne Nonnekes	1	3.85	0.0385	1
45	17PK40	American Goldfinch	D	PROB	1	Josh Shook	15	57.69	1.0769	1
45	17PK40	House Sparrow	AE	CONF	1	Joanne Nonnekes	1	3.85	0.0385	1

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Disclaimer: If you wish to use the data in a publication, research or for any purpose, or would like information concerning the accuracy and appropriate uses of these data, read the [data use policy](#) and [request form](#). **These data are current as of 7 Feb 2023 .**

LEGEND	
<p>Breeding Evidence</p> <p>Max BE: Highest Breeding Evidence recorded</p> <p>Categ: Highest Breeding Category recorded (OBS=observed, POSS=possible, PROB=probable, CONF=confirmed)</p> <p>#Sq: Number of squares with species (Breeding Evidence)</p> <p>Atlasser name: Name of atlasser who reported the highest breeding evidence (if they accepted that their name be displayed). If more than one person provided the same breeding evidence code, then only the number of atlasers is listed.</p>	<p>Point Counts</p> <p>#PC: Number of Point Counts with species</p> <p>%PC: Percent of Point Counts with species</p> <p>Abun: Average number of birds per Point Count</p> <p>#Sq: Number of squares with species (Point Counts)</p>

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 Ontario Breeding Bird Atlas, Birds Canada, 115 Front Street, P.O. Box 160 Port Rowan, ON, N0E 1M0 Canada
 Phone: 1-519-586-3531 E-mail: atlas@birdsontario.org **Banner photo:** John Reaume



Display of records for square 17PK40

All species - All life stages; most recent data first

Number of rows of data displayed below: 53.

Year	Common Name	Unique ID	Square ID
2019	Red-bellied Snake	483961	17PK40
2019	Snapping Turtle	519524	17PK40
2019	Western Chorus Frog	530947	17PK40
2018	Midland Painted Turtle	472849	17PK40
2018	Snapping Turtle	473352	17PK40
2018	Midland Painted Turtle	484301	17PK40
2018	Northern Leopard Frog	484322	17PK40
2018	Snapping Turtle	497472	17PK40
2017	Spring Peeper	365881	17PK40
2017	Midland Painted Turtle	455004	17PK40
2017	Eastern Gartersnake	459889	17PK40
2017	Midland Painted Turtle	494440	17PK40
2017	Midland Painted Turtle	494509	17PK40
2016	Blue-spotted Salamander	360463	17PK40
2016	Midland Painted Turtle	449475	17PK40

2016	Snapping Turtle	449480	17PK40
2016	Wood Frog	449986	17PK40
2016	Midland Painted Turtle	450881	17PK40
2016	Snapping Turtle	451351	17PK40
2015	Snapping Turtle	351599	17PK40
2015	Eastern Gartersnake	351806	17PK40
2015	Northern Leopard Frog	351807	17PK40
2013	Spring Peeper	154882	17PK40
2013	Snapping Turtle	351609	17PK40
2011	Gray Treefrog	160354	17PK40
2009	American Toad	160355	17PK40
2004	American Toad	154966	17PK40
2004	American Toad	154967	17PK40
2003	American Toad	154969	17PK40
2002	American Toad	154968	17PK40
2002	American Toad	154970	17PK40
2002	American Toad	154971	17PK40
2002	American Toad	154972	17PK40
2002	Blue-spotted Salamander	509794	17PK40
2001	Northern Leopard Frog	154810	17PK40
2001	Spring Peeper	154811	17PK40
2001	American Toad	155576	17PK40
2001	Spring Peeper	155577	17PK40
1991	Green Frog	159959	17PK40
1991	Wood Frog	159960	17PK40
1990	Northern Leopard Frog	155153	17PK40
1990	Snapping Turtle	443029	17PK40
1990	Snapping Turtle	443047	17PK40
1989	Spring Peeper	155151	17PK40
1989	Northern Leopard Frog	155152	17PK40
1989	Gray Treefrog	155754	17PK40

1989	Spring Peeper	155755	17PK40
1989	Northern Leopard Frog	157064	17PK40
1989	Spring Peeper	157066	17PK40
1989	Wood Frog	159227	17PK40
1989	Northern Leopard Frog	159228	17PK40
1989	Spring Peeper	159229	17PK40
1981	Green Frog	159958	17PK40

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Appendix 4. Endangered & Threatened Species Screening.



Species	ESA Status	General Description of Habitat and Range	Is the study area within the current known range of the species.	Do applicable databases contain records for this species within or adjacent to the study area.	Is suitable habitat present within the study area.	Is suitable habitat present within lands adjacent to the study area.	Discussion of relevance to proposal
Acadian Flycatcher (<i>Empidonax virescens</i>)	END	The Acadian Flycatcher is native to the Carolinian forests of Southern Ontario. It is area sensitive and prefers mature woodlands >25 ha in areas with >30% forest cover. Nesting habitats are deciduous or mixed woodlands with closed canopies, open understories, and limited groundcover. They prefer to nest near permanent or ephemeral ponds or streams.	UNKNOWN	POSSIBLE	NO	NO	The OBBA contains a possible breeding record for the associated 10km ² data square. No local records are present in NHIC or iNaturalist. No suitable habitat appears to be present within the study area. No further assessment undertaken. m
American Eel (<i>Anguilla rostrata</i>)	END	The American Eel migrates up the St. Lawrence River into the Ottawa River and Lake Ontario. They are habitat generalists and use benthic habitats with stones, debris, and vegetation for cover. Their distribution has been severely limited by human development and damming rivers.	NO	NO	N/A	N/A	N/A
American Ginseng (<i>Panax quinquefolius</i>)	END	American Ginseng requires well-drained but moist acidic to neutral soils overlying limestone or marble bedrock. They are obligate understory plants found in undisturbed mature deciduous and mixed forests, and occasionally in coniferous forests and swamps.	YES	NO	NO	NO	N/A
Bank Swallow (<i>Riparia riparia</i>)	THR	The Bank Swallow is a small aerial insectivore bird that nests colonially in burrows they excavate within banks. Colonies will nest in bluffs, riverbanks, aggregate pits, roadside embankments, and topsoil piles near open habitat that provides a steady source of insects. Colony sites must also be near roosting areas in wetland, reed, or cane beds.	YES	NO	NO	NO	N/A

¹Highlighted species are present on or are likely to be present on the subject property.

Black Ash (<i>Fraxinus nigra</i>)	END	The Black Ash grows everywhere in Ontario except the Far North. These trees love moisture, and are commonly found in northern swampy woodlands, from eastern Manitoba, throughout Ontario, and as far east as Newfoundland.	YES	NO	POSSIBLE	POSSIBLE	Individuals were not observed during the Oct 4, 2023 site investigation, undertaken during the late, leaf-on timing window. No further assessment provided.
Blanding's Turtle (<i>Emydoidea blandingii</i>)	THR	Blanding's Turtle are semi-aquatic and use wetland habitats with shallow water and abundance vegetation. Their habitat includes a broad range of wetlands, forest clearings, and meadows. They breed in aquatic habitat and nest in open natural and anthropogenic upland areas.	POSSIBLE	NO	POSSIBLE	POSSIBLE	Suitable habitat is present on the local and regional landscape; however, there are no local records of occurrence in applicable databases (NHIC, iNaturalist, ORAA). The study area itself does not appear to support the wetland structure that this species requires to fulfill life processes. In general, there is no expectation that this species would occur within the study area. No further assessment provided.
Bobolink (<i>Dolichonyx oryzivorus</i>)	THR	Nests in hayfield and pastureland. Fields must have 25% or less woody plant cover. They require large fields (>10ha) and avoid small, fragmented habitats. They also avoid habitat within 75m if a forest edge.	YES	YES	NO	NO	N/A
Butternut (<i>Juglans cinerea</i>)	END	Butternut is shade intolerant and grows in rich, moist, well-drained loams along streambanks. Butternut is also found in well-drained gravel sites. It is often found at forest edges where it can access abundant sunlight.	YES	NO	POSSIBLE	POSSIBLE	Individuals were not observed during the Oct 4, 2023 site investigation, undertaken during the late, leaf-on timing window. No further assessment provided.
Cerulean Warbler (<i>Setophaga cerulea</i>)	THR	Found in two small breeding clusters in the Carolinian Forest and the Frontenac Axis. They breed in hilly, mature deciduous forests with a preference for oak and/or maple dominated forests with swampy bottomlands. They are area and edge-sensitive and require large continuous tracts of forest.	NO	NO	NO	NO	N/A
Chimney Swift (<i>Chaetura pelagica</i>)	THR	The Chimney Swift historically nested and roosted in large hollow trees, rock walls, and other vertical surfaces. They now use human-made structures like chimneys and have high site fidelity to nesting chimneys. 95% of nests are within 1 km of a waterbody.	YES	YES	NO	NO	N/A

¹Highlighted species are present on or are likely to be present on the subject property.

Eastern Meadowlark (<i>Sturnella magna</i>)	THR	Nests in hayfields and pastureland. Will also nest in young orchards, golf courses, roadside verges, grain fields, and fencerows. Prefers habitat with >80% grass cover. Needs a minimum of 5 ha of continuous habitat.	YES	YES	NO	NO	N/A
Eastern Prairie White-fringed Orchid (<i>Platanthera leucophaea</i>)	END	The Eastern Prairie Fringed Orchid grows in open fens and wet prairies within southern Ontario. They require high sun exposure as well as high moisture. Populations are sparse, with most locations well documented.	NO	NO	NO	NO	N/A
Eastern Small-footed Myotis (<i>Myotis leibii</i>)	END	Eastern Small-footed Myotis overwinter in caves and mines in Ontario and do not disperse far from their hibernacula during the summer. They can be found roosting in rocky habitats singly or in groups but will also use human structures as day roosts. They are aerial insectivores and forage in forests, rocky habitats, and ponds.	YES	NO	NO	NO	N/A
Eastern Whip-poor-will (<i>Antrostomus vociferus</i>)	THR	The Eastern Whip-poor-will forages in open natural and anthropogenic habitats and nests in forests and forest edges with well-drained soils and moderate vegetation cover. Habitat immediately at the nest will be a short herbaceous plant, shrub, or sapling providing cover and shade with nearby perches for adults.	YES	NO	NO	NO	N/A
Henslow's Sparrow (<i>Ammodramus henslowii</i>)	END	Henslow's Sparrows' current breeding habitat is generally limited to Prince Edward County and the Regional Municipality of Halton. Their habitat is open grasslands with dense vegetation at least 30cm tall, thick standing dead material, <1% shrub cover, and intermediate moisture. They prefer larger, continuous grasslands and are sensitive to edge effects.	NO	NO	NO	NO	N/A
Jefferson Salamander (<i>Ambystoma jeffersonianum</i>)	END	Jefferson Salamanders have aquatic egg and larval stages in predatory fish-free ponds within deciduous and mixed forests. Once they metamorphose into adults they disperse up to a kilometer from their natal pond and use shaded forest habitats with thick leaf litter and high soil moisture. They use stone and woody debris as refugia.	NO	NO	NO	NO	N/A

¹Highlighted species are present on or are likely to be present on the subject property.

King Rail (<i>Rallus elegans</i>)	END	The King Rail is found on Great Lakes shorelines and inland in Bruce and Simcoe counties. They use large marshes (>231 ha) with low shrub cover, emergent vegetation, and open water. Breeding habitat is wetlands with shallow water and dense emergent vegetation to weave nests. Foraging habitat is shallow wetlands and mudflats.	UNKNOWN	NO	NO	NO	N/A
Lake Sturgeon (<i>Acipenser fulvescens</i>)	END/THR	Lake Sturgeon need large continuous habitats in river and lake systems to provide for spawning, larval, juvenile, sub-adult, and adult habitat. Spawning takes place in shallow fast flowing headwaters where a natural or man-made barrier occurs. Spawning substrates are gravel, rock, hardpan, or sand. Larval and juvenile fish use clayey substrate habitats and older fish inhabit deep pools.	YES	NO	POSSIBLE	POSSIBLE	Due to impoundments on the Pefferlaw River, there is no expectation that this species would occur at this location. No further assessment undertaken.
Least Bittern (<i>Ixobrychus exilis</i>)	THR	Breeds in large marshes within Southern Ontario. Creates nest platforms from tall, dense emergent vegetation within 10m of water and prefers <i>Typha</i> spp. Will use other emergent vegetation. Needs 200 ha of wetland for nesting and foraging but does not need to be continuous wetland. Prefers complexes of smaller wetlands. Will avoid marshes surrounded by >30% forest cover or containing large trees.	YES	NO	NO	NO	N/A
Little Brown Myotis (<i>Myotis lucifugus</i>)	END	Little Brown Myotis are found throughout all of Canada. Their hibernacula are within caves and abandoned mines, wells, and tunnels. Maternity colonies are within a few kilometers of hibernacula within snag trees, rock crevices, exfoliating tree bark, and anthropogenic structures. Roosts and swarming sites are in similar areas around the hibernacula.	YES	NO	POSSIBLE	POSSIBLE	See report for further discussion.
Louisiana Waterthrush (<i>Parkesia motacilla</i>)	THR	The Louisiana Waterthrush is mainly found along the Niagara Escarpment and north shore of Lake Erie. They are dependent on clear, steep, lower order streams in ravines within large unbroken mature deciduous-mixed forests.	POSSIBLE	NO	NO	NO	N/A

¹Highlighted species are present on or are likely to be present on the subject property.

Northern Myotis/Northern Long-eared Bat (<i>Myotis septentrionalis</i>)	END	Northern Myotis are found below the tree line in Canada and are mostly absent from the prairies. They use live and dead trees near water in forest habitats when active and migrate to caves and abandoned mines for hibernation.	YES	NO	POSSIBLE	POSSIBLE	See report for further discussion.
Purple Twayblade/Large Twayblade (<i>Liparis lilifolia</i>)	THR	Purple Twayblade is found mostly in southwestern Ontario; however, there are multiple known outlier populations. It prefers open forests and savannah with moist soil but will tolerate closed canopies, dry or moist soil, and most soil types. It also grows in swamps, prairies, alvars, and conifer plantations.	NO	NO	N/A	N/A	N/A
Red-Headed Woodpecker (<i>Melanerpes erythrocephalus</i>)	END	The Red-headed Woodpecker lives in open woodland and woodland edges and is often found in parks, golf courses and cemeteries. These areas typically have many dead trees, which the bird uses for nesting and perching. The Red-headed Woodpecker is found across southern Ontario, where it is widespread but rare.	YES	NO	UNKNOWN	UNKNOWN	While this species can be found in many generic locations, the study area does not support any open areas with large numbers of dead-standing trees that would represent ideal habitat. There are no records of occurrence on the local landscape in applicable databases (NHIC, OBBA, iNaturalist). In general, there is no expectation that the study area is supporting functional habitat for this species. No further assessment undertaken.
Redside Dace (<i>Clinostomus elongatus</i>)	END	The Redside Dace is limited to specific tributaries and watersheds of Lake Ontario, Lake Simcoe, Lake Erie, and Lake Huron. They use slow moving clear or brown-tinted streams with overhanging vegetation and pool and riffle habitat, typically in the headwaters of streams. In May when temperatures are between 16 and 18 C they spawn in the nests of Creek Chub and Common Shiner.	NO	NO	N/A	N/A	N/A
Tricolored Bat (<i>Perimyotis subflavus</i>)	END	The Tri-colored Bat have a scattered distribution and are found as far north as Sudbury. They are found in a variety of forested habitats They overwinter alone in caves and mines and roost in dead vegetation clumps and lichen in forested habitats near water.	YES	NO	POSSIBLE	POSSIBLE	See report for further discussion.

¹Highlighted species are present on or are likely to be present on the subject property.

<p>Unisexual Ambystoma - Jefferson Salamander dependent population (<i>Ambystoma laterale</i> - (2) <i>jeffersonianum</i>)</p>	<p>END</p>	<p>Unisexual Ambystoma have egg and larval stages in predatory fish-free ponds within deciduous and mixed forests. Once they metamorphose into adults they disperse up to a kilometer from their natal pond and use shaded forest habitats with thick leaf litter and high soil moisture. They use stone and woody debris as refugia.</p>	<p>NO</p>	<p>NO</p>	<p>NO</p>	<p>NO</p>	<p>N/A</p>
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¹Highlighted species are present on or are likely to be present on the subject property.

Appendix 5. Significant Wildlife Habitat Screening.



		might be present:
<p>ater during Spring (mid March to May)</p> <p>ing spring melt and run-off provide important invertebrate foraging habitat for</p> <p>l.</p> <p>with waste grains are commonly used by waterflow, these are not considered SWH</p> <p>ring sheet water available.</p>	<p>CUM1 , CUT1</p> <p>Plus evidence of annual spring flooding from melt water or run-off within these Ecosites.</p>	<p>The study area does not contain any features that may support t</p> <p>assessment provided - not SWH.</p>
<p>ices, bays, coastal inlest, and watercourses used during migration.</p> <p>onds and storm water Ponds do not qualify as a SWH, however a reservoir managed</p> <p>or pond/lake does qualify.</p> <p>o an abundance food supply (mostly aquatic invertebrates and vegetation in shallow</p>	<p>MAS1 , MAS2, MAS3, SAS1, SAM1, SAF1 , SWD1 , SWD2, SWD3, SWD4, SWD5, SWD6, SWD7</p>	<p>The study area does not contain any features that may support t</p> <p>to Pefferlaw Brook do not appear to support large shallow/oper</p> <p>that provide typical stopover habitat. No further assessment pro</p>
<p>, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and</p> <p>inc habitats.</p> <p>l shorelines, including groynes and other forms of armour rock lakeshores, are</p> <p>t for migratory shorebirds in May to mid-June and early July to October.</p> <p>onds and storm water ponds do not qualify as a SWH.</p>	<p>BBO1, BBO2, BBS1, BBS2, BBT1, BBT2, SDO1, SDS2, SDT1, MAM1 , MAM2, MAM3, MAM4, MAM5</p>	<p>The study area does not contain any features that may support t</p> <p>study area, the Pefferlaw Brook shoreline does not support broa</p> <p>bars, flats, armour rock, etc. No further assessment provided - r</p>
<p>s a combination of fields and woodlands that provide roosting, foraging and resting</p> <p>ng raptors.</p> <p>tes (hawk/owl) need to be >20 ha with a combination of forest and upland.</p> <p>s, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands</p> <p>bitat is to be wind swept with limited snow depth or accumulation.</p> <p><u>en water, large trees and snags available for roosting.</u></p> <p>o found in caves, mine shafts, underground foundations and Karsts.</p> <p>re not SWH.</p> <p>t hibernacula are relatively poorly known.</p>	<p><u>Hawks/Owls:</u></p> <p>Combination of ELC Community Series; need to have present one Community Series from each land class;</p> <p>Forest: FOD, FOM, FOC.</p> <p>Upland: CUM; CUT; CUS; CUW.</p> <p><u>Bald Eagle:</u></p> <p>Forest community Series: FOD, FOM, FOC, SWD, SWM or SWC on shoreline areas adjacent to large rivers or adjacent to lakes with open water (hunting area).</p> <p>Bat Hibernacula may be found in these ecosites: CCR1, CCR2, CCA1, CCA2.</p> <p>(Note: buildings are not considered to be SWH).</p>	<p>The study area does not contain any features that may support t</p> <p>assessment provided - not SWH.</p>
<p>can be found in tree cavities, vegetation and often in buildings (buildings are not</p> <p>VH).</p> <p>e not found in caves and mines in Ontario</p> <p>located in Mature (dominant trees > 80yrs old) deciduous or mixed forest stands with</p> <p>ter (>25cm dbh) wildlife trees</p> <p>wildlife trees (snags) in early stages of decay, class 1-3 .</p> <p>prefer older mixed or deciduous forest and form maternity colonies in tree cavities and</p> <p>in forest areas with at least 21 snags/ha are preferred</p>	<p>Maternity colonies considered SWH are found in forested Ecosites. All ELC Ecosites in ELC Community Series: FOD, FOM, SWD, SWM.</p>	<p>One or more woodland ecosites with the study area has the pote</p> <p>function. See report for further discussion.</p>

		might be present:
<p>entering areas are in the same general area as their core habitat. Water has to be deep and have soft mud substrates.</p> <p>are permanent water bodies, large wetlands, and bogs or fens with adequate</p> <p>such as sewage lagoons or storm water ponds should not be considered SWH.</p>	<p>Snapping and Midland Painted Turtles; ELC Community Classes; SW, MA, OA and SA, ELC Community Series; FEO and BOO.</p> <p>Northern Map Turtle; Open Water areas such as deeper rivers or streams and lakes with current can also be used as overwintering habitat.</p>	<p>The study area does not contain any features that may support t Brook is fast-flowing, relatively shallow, and does not appear to accumulations of mud/organic substrates in the areas proximate assessment provided - not SWH.</p>
<p>ation takes place in sites located below frost lines in burrows, rock crevices and other ed locations. The existence of features that go below frost line; such as rock piles or nces, and abandoned crumbling foundations assist in identifying candidate SWH.</p> <p>ed fissured rock are particularly valuable since they provide access to subterranean sites</p> <p>be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, drock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock</p> <p>prefer mixed forests with rock outcrop openings providing cover rock overlaying granite es.</p>	<p>For all snakes, habitat may be found in any ecosite other than very wet ones. Talus, Rock Barren, Crevice and Cave, and Alvar sites may be directly related to these habitats.</p> <p>Observations or congregations of snakes on sunny warm days in the spring or fall is a good indicator.</p> <p>For Five-lined Skink, ELC Community Series of FOD and FOM and Ecosites: FOC1, FOC3.</p>	<p>The study area does not contain any features that may support t assessment provided - not SWH.</p>
<p>with exposed soil banks, sandy hills, borrow pits, steep slopes, and sand piles that are rally eroding that is not a licensed/permitted aggregate area.</p> <p>an-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, ankments, soil or aggregate stockpiles.</p> <p>licensed/permitted Mineral Aggregate Operation.</p>	<p>Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles. Cliff faces, bridge abutments, silos, barns.</p> <p>Habitat found in the following ecosites: CUM1, CUT1, CUS1, BLO1, BLS1, BLT1, CLO1, CLS1, CLT1.</p>	<p>The study area does not contain any features that may support t assessment provided - not SWH.</p>
<p>standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally a may also be used.</p> <p>are 11 to 15 m from ground, near the top of the tree.</p>	<p>SWM2, SWM3, SWM5, SWM6, SWD1, SWD2, SWD3, SWD4, SWD5, SWD6, SWD7, FET1.</p>	<p>The study area does not contain any features that may support t of nests was observed during on-site investigations. No further</p>
<p>gulls and terns are on islands or peninsulas (natural or artificial) associated with open s, lake or large river (two-lined on a 1:50,000 NTS map).</p> <p>colonies are found loosely on the ground in or in low bushes in close proximity to on ditches within farmlands.</p>	<p>Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1:50,000 NTS map).</p> <p>Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird) MAM1 – 6, MAS1 – 3, CUM, CUT, CUS</p>	<p>The study area does not contain any features that may support t assessment provided - not SWH.</p>
<p>r area will be a minimum of 10 ha in size with a combination of field and forest habitat located within 5 km of Lake Ontario.</p> <p>ally a combination of field and forest, and provides the butterflies with a location to ng migration south.</p> <p>not be disturbed, fields/meadows with an abundance of preferred nectar plants and viding shelter are requirements for this habitat.</p>	<p>Combination of ELC Community Series; need to have present one Community Series from each landclass:</p> <p><u>Field:</u> CUM, CUT, CUS</p> <p><u>Forest:</u> FOC, FOD, FOM, CUP</p>	<p>Not applicable - study area not located within specified distanc</p>

		might be present:
<p>e > 10 ha in size and within 5 km of Lake Ontario.</p> <p>ids are located along the shoreline of those woodlands <2 km from Lake Ontario are</p> <p>of habitats; forest, grassland and wetland complexes.</p> <p>> more significant.</p> <p>t fragments are important habitats to migrating birds, these features location along the within 5 km of Lake Ontario are Candidate SWH.</p>	<p>All Ecosites associated with these ELC Community Series; FOC, FOM, FOD, SWC, SWM, SWD.</p>	<p>Not applicable - study area not located within specified distance</p>
<p>is or winter concentration areas (yards) are areas deer move to in response to the onset of cold. This is a behavioural response and deer will establish traditional use areas. The first two areas referred to as Stratum I and Stratum II. Stratum II covers the entire winter usually a mixed or deciduous forest with plenty of browse available for food. Agricultural fields included in this area. Deer move to these areas in early winter and generally, when snow falls, most of the deer will have moved here. If the snow is light and fluffy, deer may remain in the area until 30 cm snow depth. In mild winters, deer may remain in the Stratum II area</p> <p>yard (Stratum I) is located within Stratum II and is critical for deer survival in areas where snow is severe. It is primarily composed of coniferous trees (pine, hemlock, cedar, spruce) and has a cover of more than 60%.</p> <p>deer yards following methods outlined in "Selected Wildlife and Habitat Features:</p> <p>High densities of deer due to artificial feeding are not significant.</p>	<p>Note: OMNRF to determine this habitat.</p> <p>ELC Community Series providing a thermal cover component for a deer yard would include; FOM, FOC, SWM and SWC.</p> <p>Or these ELC Ecosites; CUP2, CUP3, FOD3, CUT</p>	<p>The study area is located in a mapped Deer Yarding Area (See Table 1.1 for discussion).</p>
<p>usually be >100 ha in size. Woodlots <100 ha may be considered as significant based on assessment.</p> <p>During winter in the southern areas of Ecoregion 6E are not constrained by snow depth, and annually congregate in large numbers in suitable woodlands.</p> <p>Woodlots defined by snow depth refer to the Deer Yarding Area habitat within Table 1.1 of this report.</p> <p>Woodlots <100 ha and up to 1500 ha are known to be used annually by densities of deer that range from 10 to 100 deer/ha.</p> <p>High densities of deer due to artificial feeding are not significant.</p>	<p>All Forested Ecosites with these ELC Community Series; FOC, FOM, FOD, SWC, SWM, SWD.</p> <p>Conifer plantations much smaller than 50 ha may also be used.</p>	<p>Not applicable - see Deer Yarding Area above.</p>
<p>near vertical bedrock >3m in height. A Talus Slope is rock rubble at the base of a large rocky debris</p>	<p>Any ELC Ecosite within Community Series: TAO, TAS, TAT, CLO, CFS, CLT</p>	<p>No applicable ELC communities are contained within the study area</p>
<p>usually are exposed sand, generally sparsely vegetated and caused by lack of moisture, erosion. They have little or no soil and the underlying rock protrudes through the surface. They are located within other types of natural habitat such as forest or savannah. Vegetation can range from treeless to tree covered but less than 60%.</p>	<p>ELC Ecosites: SBO1, SBS1, SBT1</p> <p>Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always < 60%.</p>	<p>No applicable ELC communities are contained within the study area</p>

		might be present:
<p>at a level, mostly unfractured calcareous bedrock feature with a mosaic of rock and soil. The hydrology of alvars may be complex, with periods of inundation and drought. Vegetation cover varies from sparse lichen-mosslands and shrublands and comprising a number of characteristic or indicator plant species. Vegetation cover varies from patchy to barren with a less than 60% tree cover.</p>	<p>ALO1, ALS1, ALT1, FOC1, FOC2, CUM2, CUS2, CUT2-1, CUW2</p> <p>Five Alvar Indicator Species: 1) Carex crawei, 2) Panicum philadelphicum, 3) Eleocharis compressa, 4) Scutellaria parvula, 5) Trichostema brachiatum</p> <p>These indicator species are very specific to Alvars within</p>	<p>No applicable ELC communities are contained within the study</p>
<p>are characterized by exhibiting the greatest number of old-growth characteristics, such as large trees that has been undisturbed. Heavy mortality or turnover of overstorey trees and a mosaic of gaps that encourage development of a multi-layered canopy and an accumulation of downed woody debris.</p>	<p>Forest Community Series: FOD, FOC, FOM, SWD, SWC, SWM</p>	<p>Woodland communities within the study area do not exhibit old-growth characteristics</p>
<p>grass prairie habitat that has tree cover between 25–60%.</p>	<p>TPS1, TPS2, TPW1, TPW2, CUS2</p>	<p>No applicable ELC communities are contained within the study</p>
<p>an open vegetation with less than < 25% tree cover, and dominated by prairie species.</p>	<p>TPO1, TPO2</p>	<p>No applicable ELC communities are contained within the study</p>
<p>that have the potential to be a rare ELC Vegetation Type as outlined in Appendix M. The study will have up to date listing for rare vegetation communities.</p>	<p>Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG.</p> <p>Any ELC Ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH.</p>	<p>No applicable ELC communities are contained within the study</p>

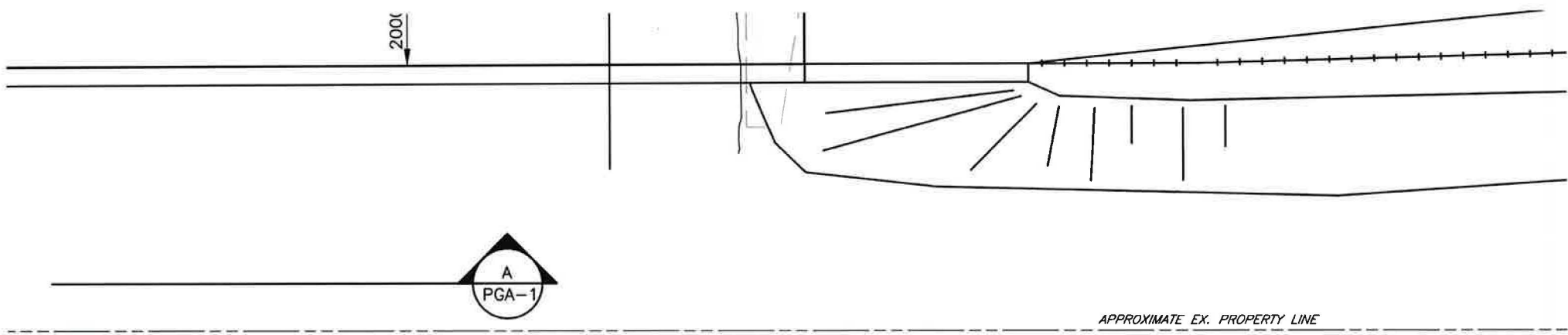
		might be present:
<p>g area extends 120 m from a wetland (> 0.5 ha) or a cluster of 3 or more small (<0.5 ha) wetlands, or 120 m of each individual wetland where waterfowl nesting is known to occur.</p> <p>should be at least 120 m wide so that predators such as raccoons, skunks, and foxes have access.</p> <p>Woodpecker, Common Goldeneye and Hooded Mergansers utilize large diameter trees in woodlands for cavity nest sites.</p>	<p>All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1, MAS2, MAS3, SAS1, SAM1, SAF1, MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SWT1, SWT2, SWD1, SWD2, SWD3, SWD4</p> <p>Note: includes adjacency to provincially Significant Wetlands</p>	<p>The study area may support waterfowl nesting functions. See report for details.</p>
<p>Forested areas with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on peninsulas.</p> <p>Usually at the top of a tree whereas Bald Eagle nests are typically in super canopy trees in a tree's canopy.</p> <p>Natural objects are not to be included as SWH (e.g. telephone poles and constructed structures).</p>	<p>ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands.</p>	<p>The study area does not contain any features that may support the nesting of waterfowl. No nests were observed during on-site investigations. No further assessment provided - not SWH.</p>
<p>Interior forested areas with a 200m buffer.</p> <p>Nests may be used again, or a new nest will be in close proximity to old nest.</p>	<p>May be found in all forested ELC Ecosites.</p> <p>May also be found in SWC, SWM, SWD and CUP3.</p>	<p>The study area does not contain any features that may support the nesting of waterfowl. No nests were observed during on-site investigations. No further assessment provided - not SWH.</p>
<p>Nesting sites for turtles are close to water and away from roads and sites less prone to loss of eggs from predators such as raccoons or other animals.</p> <p>As a turtle nesting area, it must provide sand and gravel that turtles are able to dig in open, sunny areas. Nesting areas on the sides of municipal or provincial road shoulders are not SWH.</p> <p>Shaded areas adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are not SWH.</p>	<p>Exposed mineral soil (sand or gravel) areas adjacent (<100m) or within the following ELC Ecosites: MAS1, MAS2, MAS3, SAS1, SAM1, SAF1, BOO1</p>	<p>The study area does not contain any features that may support the nesting of waterfowl. No nests were observed during on-site investigations. No further assessment provided - not SWH.</p>
<p>Wetlands with <25% meadow/field/pasture) within the headwaters of a stream or river system.</p> <p>Wetlands are important feeding and drinking areas especially in the winter will typically support a wide variety of animal species.</p>	<p>Seeps/Springs are areas where groundwater comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.</p>	<p>No seeps or springs were observed during the site investigation. No further assessment provided - not SWH.</p>
<p>Wetland or pond >500 m² (about 25 m diameter) within or adjacent (within 120m) to a forested area (of a minimum size). The wetland, lake or pond and surrounding forest, would be the Candidate SWH. Wetlands may not be mapped and may be important breeding pools for amphibians.</p> <p>Permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat.</p>	<p>All Ecosites associated with these ELC Community Series; FOC, FOM, FOD, SWC, SWM, SWD</p> <p>Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians.</p>	<p>The study area does not contain any features that may support the nesting of waterfowl. No nests were observed during on-site investigations. No further assessment provided - not SWH.</p>

<p>(including vernal pools) >500 m² (about 25 m diameter), supporting high species cant; some small or ephemeral habitats may not be identified on MNRFP mapping and amphibian breeding habitats.</p> <p>and logs increase significance of pond for some amphibian species because of for calling, foraging, escape and concealment from predators.</p> <p><u>ermanent water bodies with abundant emergent vegetation.</u></p> <p>rior forest breeding birds are breeding, typically large mature (>60 yrs old) forest >30 ha. Interior forest habitat is at least 200 m from forest edge habitat.</p>	<p>ELC Community Classes SW, MA, FE, BO, OA and SA.</p> <p>Typically these wetland ecosites will be isolated (>120m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (e.g. Bull Frog) may be adjacent to woodlands.</p>	<p>might be present:</p> <p>Wetlands within the study area have the potential to support an report for further discussion.</p>
<p>including Endangered or Threatened Species)</p> <p>etlands.</p> <p>is to be considered as long as there is shallow water with emergent aquatic vegetation</p> <p>abitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by ss frequently, it may be found in upland shrubs or forest a considerable distance from</p>	<p>All Ecosites associated with these ELC Community Series: FOC, FOM, FOD, SWC, SWM, SWD.</p>	<p>The study area does not contain any features that may support t features within the study area are not representative of interior i provided - not SWH.</p>
<p>as (includes natural and cultural fields and meadows) >30 ha Grasslands not Class 1 ds, and not being actively used for farming (i.e., no row cropping or intensive hay or in the last 5 years).</p> <p>sidered significant should have a history of longevity, either abandoned fields, mature relands that are at least 5 years or older.</p> <p>pecies are area sensitive requiring larger grassland areas than the common grassland</p>	<p>MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SAS1, SAM1, SAF1, FEO1, BOO1.</p> <p>For Green Heron: All SW, MA and CUM1 sites.</p>	<p>The study area does not contain any features that may support t features are present within the study area; however, these featu structure to support breeding marsh birds. No further assessme</p>
<p>ceeding to shrub and thicket habitats >30 ha in size.</p> <p>uccessional fields, not class 1 or 2 agricultural lands, not being actively used for x-cropping, haying or livestock pasturing in the last 5 years).</p> <p>ats (>10 ha) are most likely to support and sustain a diversity of these species.</p> <p>abitat sites considered significant should have a history of longevity, either abandoned zed pasturelands.</p>	<p>CUM1, CUM2</p>	<p>The study area does not contain any features that may support t assessment provided - not SWH.</p>
<p>ceeding to shrub and thicket habitats >30 ha in size.</p> <p>uccessional fields, not class 1 or 2 agricultural lands, not being actively used for x-cropping, haying or livestock pasturing in the last 5 years).</p> <p>ats (>10 ha) are most likely to support and sustain a diversity of these species.</p> <p>abitat sites considered significant should have a history of longevity, either abandoned zed pasturelands.</p>	<p>CUT1, CUT2, CUS1, CUS2, CUW1, CUW2.</p> <p>Patches of shrub ecosites can be complexed into a larger habitat for some bird species.</p>	<p>The study area does not contain any features that may support t assessment provided - not SWH.</p>

		might be present:
<p>edges of shallow marshes (no minimum size) should be surveyed for terrestrial crayfish. in marshes, mudflats, meadows, the ground can't be too moist. Can often be found far</p> <p>semi-terrestrial burrower which spends most of its life within burrows consisting of a Usually the soil is not too moist so that the tunnel is well formed.</p>	<p>MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, MAS1, MAS2, MAS3, SWD, SWT, SWM, CUM1 with inclusions of above meadow marsh or swamp ecosites can be used by terrestrial crayfish.</p>	<p>There is potential for terrestrial crayfish to occur within the study area. No crayfish burrows was observed during site investigation.</p>
<p>occurrence is identified within a 1 or 10 km grid for a Special Concern or Provincially Rare candidate habitat on the site needs to be completed to ELC Ecosites</p>	<p>All Special Concern and Provincially Rare (S1-S3, SH) plant and animal species.</p> <p>All plant and animal element occurrences (EO) within a 1 or 10 km grid.</p> <p>Older element occurrences were recorded prior to GPS being available, therefore location information may lack accuracy</p>	<p>There is potential for the study area to support habitat for special concern species. See report for further discussion.</p>
<p>distances between breeding habitat and summer habitat.</p> <p>distances must be determined when Amphibian breeding habitat is confirmed as SWH from Amphibian Breeding Habitat –Wetland) of</p>	<p>Corridors may be found in all ecosites associated with water.</p> <p>Corridors will be determined based on identifying the significant breeding habitat for these species (see above).</p>	<p>See report for further discussion.</p>
<p>found in all forested ecosites.</p> <p>in Stratum II Deer Wintering Area has potential to contain</p>	<p>Movement corridor must be determined when Deer Wintering Habitat is confirmed as SWH (see above).</p> <p>A deer wintering habitat identified by the OMNRF as SWH will have corridors that the deer use during fall migration and spring dispersion.</p> <p>Corridors typically follow riparian areas, woodlots, areas of physical geography (ravines, or ridges).</p>	<p>See report for further discussion.</p>

Appendix 6. Proposed Bridge Design.





PLAN
1:150

