

Guelph Pedestrian Bridges Norwich Bridge

City of Guelph, Ontario

Scoped Environmental Impact Study

Prepared for:
The City of Guelph

Project Number:
AA16-047A

Date:
March 10, 2017

ABOUD & ASSOCIATES INC.
Consulting Arborists • Ecologists • Landscape Designers

591 Woolwich Street . Guelph . Ontario . N1H 3Y5 . T:519.822.6839 . F:519.822.4052 . info@aboudtng.com . www.aboudtng.com



Table of Contents

1.0	INTRODUCTION	1
1.1	PROJECT BACKGROUND & RATIONALE	1
1.2	EXISTING LAND USE AND STUDY AREA	1
1.3	EXISTING REGULATIONS.....	1
1.3.1	<i>Provincial Policy Statement.....</i>	<i>1</i>
1.3.2	<i>Endangered Species Act, 2007</i>	<i>3</i>
1.3.3	<i>Fisheries Act, 1985</i>	<i>4</i>
1.3.4	<i>Grand River Conservation Authority</i>	<i>4</i>
1.3.5	<i>City of Guelph Official Plan</i>	<i>6</i>
1.3.6	<i>City of Guelph By-laws</i>	<i>10</i>
1.4	TERMS OF REFERENCE	11
2.0	METHODS.....	12
2.1	BACKGROUND REVIEW	12
2.2	TREES & VEGETATION	12
2.2.1	<i>Ecological Land Classification</i>	<i>12</i>
2.2.2	<i>Botanical Inventory.....</i>	<i>12</i>
2.2.3	<i>Tree Inventory</i>	<i>13</i>
2.3	WILDLIFE.....	13
2.3.1	<i>Incidental Wildlife Observations</i>	<i>13</i>
2.3.2	<i>Fish.....</i>	<i>13</i>
2.4	SIGNIFICANT WILDLIFE HABITAT	13
2.5	SAR HABITAT ASSESSMENT	14
2.6	AQUATIC HABITAT ASSESSMENT	14
3.0	EXISTING CONDITIONS	15
3.1	BACKGROUND REVIEW	15
3.1.1	<i>Natural Heritage Information Centre - Species at Risk</i>	<i>15</i>
3.1.2	<i>Ministry of Natural Resources and Forestry</i>	<i>15</i>
3.1.3	<i>Ontario Breeding Bird Atlas</i>	<i>16</i>
3.1.4	<i>Ontario Reptile and Amphibian Atlas</i>	<i>16</i>
3.1.5	<i>Atlas of the Mammals of Ontario</i>	<i>16</i>
3.2	TREES & VEGETATION	16
3.2.2	<i>Botanical Inventory.....</i>	<i>17</i>
3.2.3	<i>Tree Inventory.....</i>	<i>18</i>
3.2.4	<i>Significant Woodland.....</i>	<i>18</i>
3.3	WILDLIFE.....	18
3.3.1	<i>Incidental Wildlife Observations</i>	<i>18</i>
3.4	SIGNIFICANT WILDLIFE HABITAT	19
3.5	SAR HABITAT ASSESSMENT	19
3.6	AQUATIC HABITAT ASSESSMENT	19
3.6.1	<i>Aquatic Assessment</i>	<i>19</i>
3.6.2	<i>GRCA Records.....</i>	<i>20</i>
3.6.3	<i>DFO Self-Assessment for Projects near Water</i>	<i>20</i>
3.6.4	<i>Assessment of recommended buffers to designated features</i>	<i>21</i>
4.0	IMPACT ANALYSIS, MITIGATION, AND RESTORATION	24
4.1	ANALYSIS AND COMPARISON OF BRIDGE ALTERNATIVES	24
4.2	GENERALIZED IMPACT ASSESSMENT AND MITIGATION.....	28

4.3	HYDROLOGICAL FUNCTION AND CHANGES TO WATERCOURSE.....	32
4.4	RESTORATION, COMPENSATION AND INVASIVE SPECIES MANAGEMENT STRATEGY.....	32
5.0	LEGISLATION AND POLICY COMPLIANCE	34
5.1	PROVINCIAL POLICY STATEMENT	34
5.2	ENDANGERED SPECIES ACT.	34
5.3	FISHERIES ACT, 1985	34
5.4	GRAND RIVER CONSERVATION AUTHORITY	34
5.5	CITY OF GUELPH OFFICIAL PLAN.....	35
5.5.1	<i>Natural Heritage System.....</i>	<i>35</i>
6.0	SUMMARY AND CONCLUSIONS.....	37
6.1	BIOLOGICAL STUDIES AND SITE CONSTRAINTS	37
6.2	IMPACT ASSESSMENT	37
6.3	LEGISLATION AND POLICY COMPLIANCE	38
7.0	AVOIDANCE, MITIGATION AND COMPENSATION RECOMMENDATIONS	39
8.0	REFERENCES	42

List of Tables

Table 1. NHIC Species at Risk Records.....	15
Table 2. Ecological Land Classification Communities.....	17
Table 3. Incidental Species Observations	18
Table 4. Confirmed Significant Wildlife Habitat.....	19
Table 5. Recommended Buffers to Designated Features	22
Table 6. Comparison and rating of Impacts to Natural Heritage by Alternative	25
Table 7 Development Impacts and Mitigation Guidelines	28

List of Figures

Figure 1	Study Area and Natural Heritage Features
Figure 2	Tree Survey

List of Appendices

Appendix 1	Term of Reference and Comments
Appendix 2	MNRF Request for Information
Appendix 3	Site Investigation Details
Appendix 4	Ecological Land Classification Data Sheets
Appendix 5	Vascular Plant List
Appendix 6	Background Wildlife List
Appendix 7	Significant Wildlife Habitat Assessment
Appendix 8	Species at Risk Habitat Assessment
Appendix 9	Aquatic Assessment
Appendix 10	Fish Records
Appendix 11	Glossary of Terms and Impact Ratings
Appendix 12	Tree Survey Data
Appendix 13	Tree Inventory and Assessment Definitions

1.0 Introduction

The City of Guelph has proposed repairing or replacing an existing pedestrian bridge at the location of Norwich Street, crossing the Speed River. A Schedule 'B' Municipal Class Environmental Assessment (Class EA) has been initiated by the City to determine the feasibility and optimal design of the proposed pedestrian bridge. Aboud & Associates Inc. (AA) has been retained as part of a project team with GM BluePlan to complete the Class EA. This EIS has been completed as part of the Class EA file to characterize and document natural heritage features within the study area, assess impacts, and to propose reasonable measures to mitigate potential impacts to natural heritage features.

1.1 Project Background & Rationale

The existing Norwich Pedestrian Bridge is proposed to be repaired or replaced. The bridge connects Norwich Street on either side of the Speed River (*Figure 1*).

The proposed pedestrian bridge is identified as essential transportation infrastructure, as defined in the City's Official Plan (Pers. Comm., Adèle Labbé 2016), indicating that there is a demonstrated need for the infrastructure and no other reasonable alternatives exist (Guelph OP 2014).

The bridge is located within *Significant Natural Area*, (OP Schedule 1). The location is also within the *Regulatory Floodplain* for the *One Zone Floodplain*. Features within the Natural Heritage System, as defined under the schedules of the City of Guelph Official Plan include Significant Wildlife Habitat, Surface Water & Fish Habitat and associated minimum established buffers, Significant Woodland and associated minimum buffers, Ecological Linkages, Urban Forest and Significant Valleylands.

The proposed pedestrian bridge is within the Grand River Conservation Authority jurisdiction and Regulation Limit from a watercourse (Reg. 150/06).

1.2 Existing Land Use and Study Area

The existing land use of the area is open park and recreation space, natural lands, and an existing pedestrian corridor connecting the east and west side of the Speed River. Residential properties are adjacent to the river on the east side, downstream from the bridge. The study area includes all lands within 30 meters from the bridge location (*Figure 1*).

1.3 Existing Regulations

1.3.1 Provincial Policy Statement

The *Provincial Policy Statement* ([PPS] OMMHA 2014) provides policy direction on matters of provincial interest related to land use planning and development.

In regards to **community development** the PPS states that:

Healthy, active communities should be promoted by:

- a) planning public streets, spaces and facilities to be safe, meet the needs of pedestrians, foster social interaction and facilitate active transportation and community connectivity;*
- b) planning and providing for a full range and equitable distribution of publicly-accessible built and natural settings for recreation, including facilities, parklands, public spaces, open space areas, trails and linkages, and, where practical, water-based resources;*
- c) providing opportunities for public access to shorelines; and*
- d) recognizing provincial parks, conservation reserves, and other protected areas, and minimizing negative impacts on these areas.*

In regards to **Natural Heritage Protection** the PPS states that:

“Natural features and areas shall be protected for the long term.”

And that:

“The diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of natural heritage systems, should be maintained, restored or, where possible, improved, recognizing linkages between and among natural heritage features and areas, surface water features and ground water features.”

Under the PPS, development and site alteration are not permitted in:

- a) significant wetlands;*
- b) significant woodlands;*
- c) significant valleylands;*
- d) significant wildlife habitat;*
- e) significant areas of natural and scientific interest; and*
- f) coastal wetlands,*

unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.

The PPS (2014) also states that:

- *“Development and site alteration is not permitted in fish habitat, habitat of endangered species and threatened species except in accordance with provincial and federal requirements.*
- *Development and site alteration is not permitted on adjacent lands to the natural heritage features and areas identified above, unless the ecological function of the*

adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.

- *Development and site alteration is restricted in or near sensitive surface water features and sensitive ground water features in order to protect the hydrologic functions of the feature. Mitigation and/or alternative development approaches may be required in order to protect, improve or restore sensitive surface water features, sensitive ground water features, and their hydrologic functions.”*

Under Section 1.6.8.5, these significant resources shall be given consideration in the planning of significant transportation *infrastructure*.

The proposed repair or replacement of the Norwich Pedestrian Bridge is considered infrastructure and therefore is not prohibited on lands containing significant natural resources. However, natural features must be documented and considered when selecting a preferred option.

1.3.2 Endangered Species Act, 2007

The provincial Endangered Species Act, 2007 (ESA) provides protection to species designated as Threatened or Endangered on the Species at Risk in Ontario list (MNRF 2015a). The habitat of Species at Risk is also generally protected under the ESA. Protected habitat is habitat identified as essential for life processes including breeding, rearing, feeding, hibernation, and migration.

The ESA (Subsection 9(1)) states that:

“No person shall,

- (a) kill, harm, harass, capture or take a living member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species;*
- (b) possess, transport, collect, buy, sell, lease, trade or offer to buy, sell, lease or trade,*
 - (i) a living or dead member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species,*
 - (ii) any part of a living or dead member of a species referred to in subclause (i),*
 - (iii) anything derived from a living or dead member of a species referred to in subclause (i); or*
- (c) sell, lease, trade or offer to sell, lease or trade anything that the person represents to be a thing described in subclause (b) (i), (ii) or (iii).”*

Clause 10(1)(a) of the ESA also states that:

“No person shall damage or destroy the habitat of a species that is listed on the Species at Risk in Ontario list as an endangered or threatened species.”

An authorization or permit between the proponent and the Minister of Natural Resources and Forestry is required to authorize activities that would otherwise be prohibited by subsection 9(1) and 10(1) of the ESA.

1.3.3 Fisheries Act, 1985

The study area contains fish-bearing waters in the form of the Speed River. This area and the fish within are protected under the Federal Fisheries Act, 1985. The Fisheries Act provides protection for the sustainability and ongoing productivity of Canada's recreational, commercial and Aboriginal fisheries.

Section 35 (1) of the Fisheries Act States that:

"No person shall carry on any work, undertake activity that results in serious harm to fish that are part of a commercial, recreational or Aboriginal fishery, or fish that support such a fishery"

The Fisheries Act requires that projects and activities avoid causing serious harm to fish and fish habitat unless authorized to do so by the Department of Fisheries and Oceans Canada (DFO). This applies to work conducted in or near waterbodies that support recreational, commercial and Aboriginal fisheries. Within the context of the pedestrian bridge, any proposed actions that could impact fish or fish habitat would need to be assessed for compliance with the Fisheries Act. If it is determined that proposed actions will cause serious harm to fish, which cannot be mitigated for, then a Fisheries Act Authorization would be required.

1.3.4 Grand River Conservation Authority

The study area is located within the jurisdiction and Regulation Limits of the Grand River Conservation Authority (GRCA).

The proposed bridge is entirely within the Flooding Hazard Limit and the regulatory allowances.

Section 8.1.18 of the GRCA's Policies for the Administration of the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation (Ontario Regulation 150/06, 2015) identifies recreational uses such as trails and river access points may be permitted *"in accordance with the policies in Sections 7.1.2-7.1.3 - General Policies, and where it can be demonstrated that:*

- a) There is no feasible alternative site outside the Riverine Flooding Hazard,*
- b) There is no loss of flood storage,*
- c) where unavoidable, intrusions on significant natural features or hydrologic or ecological functions are minimized and it can be demonstrated that best management practices including site, facility and/or landscape design and appropriate remedial measures will adequately restore and enhance features and functions, and*
- d) The risk of property damage is minimized through site and facility design and flood emergency plans."*

Section 8.1.15:

“Public Infrastructure including but not limited to roads, sanitary sewers, utilities, water and sewage treatment plants, water supply wells, well houses, and pipelines may be permitted in accordance with the policies in Sections 7.1.2- 7.1.3 – General Policies, provided that there is no feasible alternative site outside the Riverine Flooding Hazard as determined through an Environmental Assessment or other comprehensive plan supported by the GRCA, and where it can be demonstrated that:

- a) adverse hydraulic or fluvial impacts are limited and any risk of flood damage to upstream or downstream properties is not increased or is minimized through site design and the affected landowner(s) is informed of the increased risk,*
- b) there is no loss of flood storage wherever possible, and*
- c) where unavoidable, intrusions on significant natural features or hydrologic or ecological functions are minimized and it can be demonstrated that best management practices including site and infrastructure design and appropriate remedial measures will adequately restore and enhance features and functions”*

Section 9.1 states:

“Any alteration to the channel of a river, creek, stream or watercourse requires permission from the GRCA. This includes activities such as, but not limited to, culvert placement or replacement, bridge construction, bed level crossings, piping of watercourses, installation or maintenance of pipeline crossings, cable crossings, construction or maintenance of by-pass, connected or online ponds, straightening and diversions as well as any work on the bed or the banks of the watercourse such as bank protection projects.”

And 9.1.2 states:

“Crossings including but not limited to bridges, culverts, pipelines, channel enclosures of less than 20 metres (66 feet) and causeways may be permitted to be constructed, replaced or upgraded in accordance with the policies in Sections 7.1.2 - 7.1.3 – General Policies and Sections 8.1.16 - 8.1.17 and/or Section 8.2.21 where appropriate, and provided that all feasible alternative sites and alignments have been considered through an Environmental Assessment supported by the GRCA Policies for the Administration of Ontario Regulation 150/06 Revisions, October, 2015 Page 48 or through site-specific studies, whichever is applicable based on the scale and scope of the project, 27 and where it can be demonstrated that:

- a) crossings avoid any bends in the watercourse to the extent practical,*
- b) crossings are located to take advantage of existing impacted or open areas on the channel bank or valley slope, wherever possible,*
- c) crossing structures avoid the Riverine Erosion Hazard in order to accommodate natural watercourse movement, wherever possible,*

d) the risk of flood damage to upstream or downstream properties is reduced through site and infrastructure design, wherever possible,

e) there is no inhibition of fish passage,

f) where unavoidable, intrusions on significant natural features or hydrologic or ecological functions are minimized and it can be demonstrated that best management practices including site and infrastructure design and appropriate remedial measures will adequately restore and enhance features and functions.

g) physical realignments or alterations to the river, creek, stream or watercourse channel associated with a new crossing are avoided or are in accordance with the policies in Section 9.1.16, and

h) maintenance requirements are minimized”.

1.3.5 City of Guelph Official Plan

The Guelph Official Plan (OP) identifies the goals, objectives and policies intended to guide land use and activities while having regard for the social, economic and natural environment of the Guelph community.

The proposed bridge is considered essential transportation infrastructure under the City of Guelph Official Plan (Pers. Comm., Adèle Labbé 2016).

The OP indicates that no development is permitted within the One Zone Floodplain, but may be used for outdoor recreation (excluding buildings and structures) and open space and conservation areas.

The City of Guelph OP states that they will encourage and develop a system of publicly accessible parkland, open space and trails, including shoreline areas that:

- a) clearly demarcates where public access is and is not permitted;*
- b) is based on a co-ordinated approach to trail planning and development; and*
- c) is based on good land stewardship practices for public and private lands.*

1.3.5.1 Natural Heritage System

OP section 6A.1.2 states that:

Development and site alteration shall not be permitted within the Natural Heritage System, including minimum or established buffers, except for the following uses:

- i) legally existing uses, buildings or structures;
- ii) passive recreational activities;
- iii) low impact scientific and educational activities;
- iv) fish and wildlife management;
- v) forest management;
- vi) habitat conservation; and
- vii) restoration activities.

The OP also states in section 6A.1.2.10 that:

An expansion of a legally existing building or structure may be permitted within the Natural Heritage System without an amendment to the Official Plan provided that it can be demonstrated, to the satisfaction of the City and the GRCA, where applicable, through an EIS, that the objectives of the designation can be met and that the proposed expansion will not have a negative impact on the natural heritage features and areas or ecological functions for which the area is identified. Existing uses will be discouraged from expanding further into Significant Natural Areas and minimum or established buffers. Such expansions shall be minor in proportion to the size and scale of the building or use and shall not result in further intensification of the use.

OP section 6A.1.2 (7) states:

“Where essential transportation infrastructure, essential linear infrastructure, storm Water management facilities and structures, and/or trails are permitted within minimum or established buffers under policies 6A.2 and 6A.3, the following shall apply:

- i) works are to be located as far away from the feature boundary within the minimum or established buffer as possible;*
- ii) the area of construction disturbance shall be kept to a minimum; and*
- ii) disturbed areas of the minimum or established buffers shall be re-vegetated or restored with site appropriate indigenous plants wherever opportunities exist.”*

OP section 6A1.2 (8) states:

“Where essential transportation infrastructure, essential linear infrastructure, stormwater management facilities and structures, and/or trails are permitted within natural heritage features and areas under policies 6A.2 and 6A.3, the following shall apply:

- i) The area of construction disturbance shall be kept to a minimum; and*
- ii) Disturbed areas shall be re-vegetated or restored with site-appropriate indigenous plants wherever opportunities exist.”*

Any permitted infrastructure, including the proposed pedestrian bridge, must consider the Natural Heritage System and minimize impact where feasible. Areas disturbed should be revegetated and enhanced where opportunities exist.

1.3.5.2 Surface Water Features and Fish Habitat

OP section 6A.2.5 (5) states:

“In addition to the General Permitted Uses of Section 6A.1.2, the following additional uses may be permitted within Surface Water Features, Fish Habitat and established buffer, subject to the requirements under 6A.1.2.7 and 6A.1.2.8:

- iii) essential linear infrastructure and their normal maintenance;*
- iv) essential transportation infrastructure and their normal maintenance;*
- v) flood and erosion control facilities or other similar works and their normal maintenance; and*
- vi) stormwater management facilities and structures and their normal maintenance.”*

OP section 6A.2.5 (6) states:

“These additional uses may only be permitted where it has been demonstrated through an EIS, EA or subwatershed plan, to the satisfaction of the City, in consultation with the MNR and/or the GRCA, and/or the Department of Fisheries and Oceans (DFO), that:

- i) there will be no negative impacts on the water resources, fish habitat or related ecological and hydrologic functions;*
- ii) there will be no net loss of fish habitat, and no harmful alteration, disruption, or destruction of fish habitat;*
- iii) where authorization for the harmful alteration, disruption, or destruction of fish habitat has been obtained from DFO under the Fisheries Act using the guiding principle of no net loss of productive capacity, and the impact of development on fish habitat will be avoided or fully mitigated; and if not, the loss of fish habitat will be adequately compensated for through a compensation plan approved by the GRCA and/or the DFO; and*
- iv) all applicable protocols or policies of the provincial and federal government have been met.”*

Under OP section 6A.2.5 development and site alteration are not permitted within Surface Water features and Fish Habitat or their established buffer, except for uses permitted by the General Permitted uses of section 6A.

Any construction within or across surface water features or fish habitat must occur during the appropriate MNRF fisheries timing window to avoid or minimize impacts on fish, wildlife and water quality; and implement best management practices during construction.

The OP also indicates that opportunities to restore permanent and intermittent stream and fish habitat are encouraged and will be supported.

1.3.5.4 Significant Wildlife Habitat

The watercourse within the study is identified as Significant Wildlife Habitat in Schedule 10E: Natural Heritage System. The watercourse is considered Significant Wildlife Habitat for Waterfowl Overwintering.

Under OP section 6A.2.9, Development and site alteration shall not be permitted within Significant Wildlife Habitat (including Ecological Linkages) or the established buffers, where applicable, except for uses permitted by the General Permitted Uses of Section 6.A.1.2.

4. Development and site alteration may be permitted on adjacent lands to Significant Wildlife Habitat (including Ecological Linkages) where it has been demonstrated through an EIS or EA to the satisfaction of the City, and GRCA where applicable, that there will be no negative impacts to Significant Wildlife Habitat or its ecological functions.

6. The extent of the habitat and buffers for Significant Wildlife Habitat will be established through an EIS or EA, to the satisfaction of the City, in consultation with the GRCA where appropriate, with consideration for the MNR's technical guidance, and the local and regional context.

7. Additional areas of Significant Wildlife Habitat (i.e., in addition to those areas shown on Schedule 10 and Schedule 10E, including Ecological Linkages) May be identified through an EIS or EA based on consideration for the MNR's technical guidance. These additional areas will be subject to the applicable policies.

While Essential Transportation infrastructure is not identified as an additional permitted use within significant wildlife habitat or their established buffers, the Norwich Street Bridge is an existing structure, and is permissible under the generally permitted uses of the Natural Heritage System guidelines of the Official Plan.

1.3.5.3 Ecological Linkages

While no Ecological Linkages are mapped within the study area on schedule 10, the river corridor is a natural linkage for natural heritage features in this area, including Significant Wildlife Habitat, as such; the following policy will also be applied.

Connectivity between Significant Natural Areas and/or protected Habitat for Significant Species shall be maintained, and where appropriate, enhanced, with Ecological Linkages.

1.3.5.4 Significant Woodlands

Under OP section 6A.2.6 it indicates that development and site alteration are not permitted within Significant Woodlands and their established buffers except for uses permitted by the General Permitted Uses of Section 6A. Significant Woodlands also require a minimum buffer of

10 m from the drip line of the trees at the woodland edge, except where existing development precludes it.

In addition to the General Permitted Uses of Section 6A.1.2, essential linear infrastructure and, stormwater management facilities and structures, and their normal maintenance, may be permitted in the established buffers to Significant Woodlands, subject to the requirements of 6A.1.2.7, where it has been demonstrated through an EIS or EA study, to the satisfaction of the City that there will be no negative impacts on the feature or its ecological and hydrologic functions.

1.3.5.5 Significant Valleylands

Under OP section 6A.2.7, development and site alteration are not permitted within Significant Valleylands and their established buffers except for uses permitted by the General Permitted Uses of Section 6A.

The following additional uses may be permitted within Significant Valleylands and established buffers, subject to the requirements of 6A.1.2.7 and 6A.1.2.8, where it has been demonstrated through an EIS or EA, to the satisfaction of the City, and where applicable the GRCA, that there will be no negative impacts on the natural characteristics of the valley features or its ecological or hydrologic functions, nor will there be increased susceptibility to natural hazards:

- i) essential linear infrastructure and their normal maintenance;
- ii) essential transportation infrastructure and their normal maintenance;
- iii) flood and erosion control facilities or other similar works;
- iv) renewable energy systems; and
- v) stormwater management facilities and structures and their normal maintenance in accordance with the surface water features and fish habitat policies of this Plan.

Where Significant Valleylands are disturbed, the City promotes restoration and/or naturalization in order to improve water quality and quantity, ensure bank and slope stabilization, and to enhance wildlife habitat.

1.3.5.6 Urban Forest

The City's Urban Forest includes smaller wooded areas less than 1 ha, that are not included in the City's Natural Heritage System. The City of Guelph recognizes that in some cases urban woodlands are degraded (e.g., dominated by invasive species) and that new development may provide opportunities for enhancement and restoration as part of the proposed site alteration.

Policies of the Urban Forest include the encouragement to retain healthy non-invasive trees to the fullest extent possible, compensating for trees that must be removed, and the removal of invasive, non-native trees and shrubs.

1.3.6 City of Guelph By-laws

Any tree removal (trees >10cm DBH) will be subject to the City of Guelph Tree By-law. Where the City is undertaking infrastructure work, healthy non-invasive trees within the urban forest will be retained to the fullest extent possible. Where regulated trees are damaged or destroyed a Tree Preservation and Vegetation Compensation Plan is needed.

1.4 Terms of Reference

Based on the above regulations and policies (Section 1.3) and communication with regulatory authorities, an EIS is required for the construction of the proposed pedestrian bridge, as there may be the potential for negative impacts to the natural heritage system.

A proposed Terms of Reference (ToR) for the EIS was developed and submitted to the City of Guelph, the City of Guelph River Systems Advisory Committee (RSAC) on June 12, 2016. The ToR was subsequently provided to the GRCA on July 21, 2016. Comments regarding the proposed ToR were received from the City of Guelph Staff/RSAC on August 4, 2016, and from the GRCA on September 14th, 2015.

Based on comments received from RSAC, the Significant Woodland adjacent to the bridge was delineated through a combination of field survey and air photo interpretation. Correspondence with the MNRF was conducted to identify potential SAR within the study area.

2.0 Methods

2.1 Background Review

A background information review was conducted of both biological and physical features within the vicinity of the study area. The following resources were consulted as part of this review:

1. Fisheries and Oceans Canada (DFO), Online mapping (accessed: 2016)
2. Ministry of Natural Resources and Forestry (MNRF), Guelph District (*Appendix 2*)
3. Natural Heritage Information Centre (NHIC) database (accessed: 2016)
4. Ontario Reptile and Amphibian Atlas Interactive map (Ontario Nature 2016)
5. Ontario Mammal Atlas (1994)
6. Atlas of the Breeding Birds of Ontario, 2001-2005
7. Grand River Conservation Authority Regulation Mapping (accessed 2016)
8. Region of Wellington Significant species list (2008)
9. City of Guelph Official Plan, 2014
10. Locally Significant Species List – City of Guelph (2012)

2.2 Trees & Vegetation

2.2.1 Ecological Land Classification

Ecological Land Classification (ELC) field investigations were completed on August 17, 2016. Detailed survey dates and weather information are provided in *Appendix 3*. Surveys were completed by qualified ecologist, Ryan Hamelin, OMNRF Certified in Ecological Land Classification. Vegetation communities within the study area were characterized and delineated through field investigation, following the Ecological Land Classification (ELC) system for Southern Ontario 1st approximation; community codes generally follow the 2nd approximation (Lee, et al., 1998, 2008). Boundaries of ELC communities were mapped using aerial images and field observations (*Figure 1*). Digitized ELC data sheets are provided in *Appendix 4*.

Identified ELC communities were cross-referenced with the NHIC Ontario Plant Community List (NHIC 2015) to determine the presence of rare plant communities (S3-S1). The Subnational, or Provincial, Ranks (S-Rank) are assigned by the Ontario Ministry of Natural Resources and Forestry (MNRF) Natural Heritage Information Centre (NHIC) in order to help assign protection priorities.

2.2.2 Botanical Inventory

Concurrent with ELC evaluations, the subject lands were systematically searched in order to provide a comprehensive one season botanical inventory. Detailed survey dates and weather information are provided in *Appendix 3*.

Identified vascular plant species were compared to provincial and federal SAR lists (COSARO, SARA 2014) provincial ranks (NHIC 2015), global ranks, Significant Plants of Wellington County (Dogan & Associates 2009), and City of Guelph – Locally Significant Species List (Guelph 2012) in order to assess federal, provincial, regional and local conservation status of each species. English colloquial names and scientific binomials of plant species generally follow the Database of Vascular Plants of Canada (VASCAN) (VASCAN 2015).

Identification of environmentally sensitive plant species was completed based on the assignment of a coefficient of conservatism value (CC) for each native species (Oldham, et al., 1995). The value of CC, ranging from 0 (low) to 10 (high), is based on a species' tolerance of disturbance and fidelity to specific natural habitat parameters. Species with a CC value of 9 or 10 generally exhibit a high degree of fidelity to a narrow range of habitat parameters. These species may be more sensitive to environmental changes (Mortarello et. al., 2010).

A list of all identified plant species is provided in *Appendix 5*. The list provides botanical name, common name, provincial rarity rank (S-Rank), global rarity rank (G-Rank), provincial SAR status, federal SAR status, Local Rarity/Significance within Wellington County (Dogan & Associates 2009) and City of Guelph – Locally Significant Species List (Guelph 2012), coefficient of conservatism (CC) and coefficient of wetness (CW). Plant species that could only be identified to genus were not assigned the above information.

2.2.3 Tree Inventory

Within 30 meters from the bridge location, a total of 44 trees with a diameter at breast height (DBH) of 10cm or greater were inventoried and surveyed by Steven Aboud, ISA Certified Arborist, and Ryan Hamelin on October 12, 2016. DBH, species, biological health, structural condition, overall condition and estimated crown reserve were collected for each tree.

2.3 Wildlife

2.3.1 Incidental Wildlife Observations

Incidental observations of insects, mammals and reptiles were recorded during all field visits. Detailed survey dates and weather information are provided in *Appendix 3*.

2.3.2 Fish

Background fish records for the Speed River were provided by GRCA and reviewed (*Appendix 10*). DFO Species at Risk and Species at Risk Habitat screening was completed.

2.4 Significant Wildlife Habitat

With guidance from the *Significant Wildlife Habitat Technical Guide* (2000) and the *SWH EcoRegion Criterion Schedule 6E* (MNRF 2015b), the study area and adjacent lands were considered for the presence of Significant Wildlife Habitat (e.g. specialized habitats for wildlife, habitat for species of conservation concern). Detailed survey dates and weather information are provided in *Appendix 3*. An assessment of the study area for all SWH is provided in *Appendix 7*.

2.5 SAR Habitat Assessment

A thorough review of background documents was conducted to compile a master list of all Species at Risk, and species with conservation designation that may occur in the study area. A review of the site, along with habitat requirements for each species was conducted; the site was then evaluated for potential habitat using Ecological Land Classification, guidance from MNRF documents, and on-site knowledge acquired through field surveys. Detailed survey dates and weather information are provided in *Appendix 3*. An assessment of the study area for candidate habitat for SAR is provided in *Appendix 8*.

2.6 Aquatic Habitat Assessment

On August 17th, 2016 and October 12th, 2016, an Aquatic Habitat Assessment was completed by Ryan Hamelin, OMNRF Certified in Ontario Stream Assessment Protocol, for all sections of watercourses in the study area. Detailed survey dates and weather information are provided in *Appendix 3*. The Aquatic Habitat Assessment was completed in order to determine the quality of habitat for fish, barriers to fish movement, and general aquatic habitat characteristics. Stream reaches within the study area were characterized with respect to the following criteria:

- Mean channel width;
- mean channel depth;
- mean water depth;
- percent stream shading;
- buffer width;
- substrate;
- flow pattern;
- channel morphology;
- instream cover;
- bank characteristics; and
- presence of specific site features.

In addition to the field Aquatic Habitat Assessment, data provided by the GRCA such as fish collection records, and thermal fish community classification information was used to characterize the watercourse.

3.0 Existing Conditions

Information that characterizes the existing conditions of the study area came from several sources, including but not limited to, background review of existing documents, public information sources, and field reconnaissance.

3.1 Background Review

3.1.1 Natural Heritage Information Centre - Species at Risk

Preliminary investigation through the Natural Heritage Information Centre (NHIC) identified three provincial Species at Risk (SAR) under the ESA and one additional species ranked as rare (SH-S3) recorded within approximately 1km of the study area (17NJ6022). These species and their habitat requirements are summarized in *Table 1*.

Table 1. NHIC Species at Risk Records

Scientific Name	Common Name	(COSEWIC) Status ¹	(SARO) Status ²	Last Observed (NHIC)	S-Rank ³	Habitat Requirements
<i>Graptemys geographica</i>	Northern Map Turtle	SC	SC	1924	S3	Highly aquatic species, found in deep, large waterbodies, including lakes and large rivers, with abundant basking sites. Emerge onto land only during nesting, which occurs in soft sand or soil. Waterbodies with slow currents, soft mud bottoms, and abundant aquatic vegetation are preferred (COSEWIC 2002a).
<i>Thamnophis sauritus</i>	Eastern Ribbonsnake	SC	SC	1990	S3	A semi-aquatic species that inhabits dense, low- vegetation, edges of ponds, streams, marshes, fens, and bogs, with open sunlit areas for basking (COSEWIC 2002b).
Rusty-patched Bumble Bee	<i>Bombus affinis</i>	END	END	1998	S1	Uses a variety of open or semi-open habitat, including meadows, agricultural land and savannah habitat for foraging. Nests are often found underground, in old rodent burrows (COSEWIC 2010).
<i>Carex careyana</i>	Carey's Sedge	NAR	NAR	1905	S2	Found in mature dry to moist rich hardwood forests (NatureServe 2015).

¹ COSEWIC – Committee on the status of endangered wildlife in Canada

² SARO – Species at Risk Act Ontario

³ S-Rank – Denotes the conservation status of a species at the provincial level

SH: Possibly Extirpated

S1: Critically Imperiled

S2: Imperiled

S3: Vulnerable

3.1.2 Ministry of Natural Resources and Forestry

A request for information was sent to the MNR on June 21, 2016, to inquire whether any further Species at Risk may occur in the study area. A response was provided on July 7, 2016, and is provided in *Appendix 2*. No SAR occurrence records were provided.

3.1.3 Ontario Breeding Bird Atlas

A list of birds determined to be breeding (Possible, Probable or Confirmed) in the 10km x 10km square containing the study area during the 2001-2005 Ontario Breeding Bird Atlas (Cadman et. al. 2007) was compiled. This list includes 109 species; ten are considered Species at Risk under the ESA and one species listed under COSEWIC. No habitat for Species at Risk birds was identified in the study area. A review of Species at Risk identified through background resources and their habitat requirements are discussed in *Appendix 8*. 41 species are considered Locally Significant in the City of Guelph (City of Guelph, 2012), and 53 are considered Significant Species in Wellington County (Dougan & Associates 2009). The findings of this review are presented in *Appendix 6*.

3.1.4 Ontario Reptile and Amphibian Atlas

Review of the Ontario Reptile and Amphibian Atlas identified 28 species that are known to occur within the 10km x 10km square containing the study area. This list includes four Species at Risk under the ESA; Common Snapping Turtle (*Chelydra serpentina*), Eastern Ribbonsnake (*Thamnophis sauritus*), and Northern Map Turtle (*Graptemys geographica*), are listed as Special Concern provincially and federally; Blanding's Turtle (*Emydoidea blandingii*), is listed as Threatened; Milksnake (*Thamnophis sauritus*) is listed as Special Concern federally and Western Chorus Frog / St. Lawrence - Canadian Shield Population (*Pseudacris triseriata pop. 2*) is listed as Threatened federally. Confirmed nesting or overwintering habitat was not identified in the study area for any of these species, although overwintering habitat may be present within other areas of the Speed River for Common Snapping Turtle. Twelve species are considered Locally Significant in the City of Guelph, and seventeen are considered Significant Species in Wellington County (Dougan & Associates, 2009). The findings of this review are presented in *Appendix 6*.

3.1.5 Atlas of the Mammals of Ontario

Review of the Atlas of the Mammals of Ontario (1994) identified twenty-nine species that are known to occur within approximately 10km of the study area. This list includes one Species at Risk under the ESA; Little Brown Myotis (*Myotis lucifugus*) are listed as Endangered provincially and federally. Potential maternity habitat was not identified in the study area for this species. A review of all Species at Risk identified in the background review and their habitat requirements are discussed in *Appendix 8*. Two of the species identified as occurring in the square are considered Locally Significant in the City of Guelph (City of Guelph, 2012) and two are considered Significant Species in Wellington County (Dougan & Associates, 2009). The findings of this review are presented in *Appendix 6*.

3.2 Trees & Vegetation

3.2.1 Ecological Land Classification

A one season ELC evaluation was completed on August 17, 2016, by Aboud & Associates. Five ELC polygons, consisting of four unique ELC communities, were identified and mapped in the study area (*Figure 1*). The community polygons identified during the ELC surveys are summarized in *Table 2*. Digitized field forms are provided in *Appendix 4*. Comparison with the

NHIC Rare Plant Communities confirmed that none of the ELC communities identified within the study area are listed as provincially rare plant communities (S1 – S3).

Table 2. Ecological Land Classification Communities

ELC Code ¹	Vegetation Type	Summary Description
Mixed Meadow (MEM)		
MEMM3	Dry Fresh Mixed Meadow Ecosite	This community has established on a recently disturbed area consisting of a pile of soil. The species present are largely non-native grasses and forbs such as Orchard Grass (<i>Dactylis glomerata</i>), Greater Celandine (<i>Chelidonium majus</i>), Awnless Brome (<i>Bromus inermis</i>), and Fuller's Teasel (<i>Dipsacus fullonum</i>).
Deciduous Forest (FOD)		
FODM4-5	Dry – Fresh Manitoba Maple Deciduous Forest Type	This is a culturally influenced community on either side of the Speed River. The canopy is dominated by Manitoba Maple (<i>Acer negundo</i>), with minor occurrences of Black Walnut (<i>Juglans nigra</i>), and White Elm (<i>Ulmus americana</i>). The Subcanopy consisted of young canopy species, with a high occurrence of Common Buckthorn (<i>Rhamnus cathartica</i>). Understory species included Wild Red Raspberry (<i>Rubus idaeus</i>), Black Raspberry (<i>Rubus occidentalis</i>), and Canada Goldenrod (<i>Solidago canadensis</i>), with Spotted Joe Pye Weed (<i>Eutrochium maculatum</i>) common along the water's edge. Herbaceous ground cover is dominated by exotic weedy species, such as Garlic Mustard (<i>Alliaria petiolata</i>) and Greater Celandine.
Constructed (CV)		
CGL_2	Parkland	This is cultural landscaped park community consisting of mowed grass, planted trees, and trails. The planted tree species within the study area are White Spruce (<i>Picea glauca</i>) and Austrian Pine (<i>Pinus nigra</i>). This community has no identified naturalized vegetation.
Shallow Aquatic (SA)		
SA	Shallow Aquatic	This community consists of the Speed River watercourse and is characterized as a Shallow Water community with an average depth of less than 2 meters. The watercourse contains little to no aquatic plant species. A more detailed description of the community is provided in the Aquatic Habitat Section.

ELC Codes generally follows the ELC Second Approximation (Lee 2008)

3.2.2 Botanical Inventory

A detailed botanical field inventory of the study area was completed and 43 species of vascular plants, from 24 families, were identified. All identified plant species are listed in *Appendix 5*.

Of 43 species identified, 21 species (49%) are native and 22 species (51%) are exotic or cultivars.

3.2.2.1 Species at Risk, Regional and Local Significance

All but one of the native vascular plants observed in the study area are ranked as secure in Ontario (S5) or apparently secure (S4) and globally, very common (G5) or common (G4) (NHIC 2015).

Cup Plant (*Silphium perfoliatum*) is ranked as Imperiled (S2) in Ontario. However, the specimens within the study area are planted varieties growing in gardens and should not be considered rare or protected within Ontario.

No identified species are listed under SARO or COSEWIC and no species are listed as a Significant Species in Wellington County (Dougan & Associates et. al. 2009) or as a Locally Significant Species in the City of Guelph (2012).

Cup Plant was the only species observed in the study area that had a co-efficient of conservatism of 9. These specimens were of planted origin and were not naturally occurring. All other species had a co-efficient of conservatism value of less than 9. This indicates the presence of species with moderate to high tolerance for environmental ranges, which may be less impacted by minor site alterations or environmental disturbance.

3.2.3 Tree Inventory

The tree inventory collected information for 44 trees in the study area. The individual tree data is provided in *Appendix 12* with the tree inventory and assessment definition provided in *Appendix 13*. The locations and identification numbers of surveyed trees are shown on *Figure 2*.

71% of the trees inventoried in the study area were Manitoba Maple, with Black Walnut (13%), White Spruce (8 %), American Elm (4%) and Austrian Pine (4%) as other minor occurrences. A detailed tree protection plan will be provided under separate cover.

3.2.4 Significant Woodland

The Significant Woodland within the study area was delineated through a combination of field review and orthophotography interpretation. The woodland boundary was reviewed in the field with Adèle Labbé, City of Guelph Environmental Planner on November 3, 2016. During the field review, it was determined that only the section of Woodland north of the bridge and east of the river meet the criteria for Significant Woodland; this is also consistent with the existing City of Guelph Mapping in the Official Plan. The other wooded areas were determined to be too narrow and/or were not contiguous and therefore did not meet the criteria for Significant Woodland.

Following field review, the woodland boundary was delineated through orthophotography interpretation. The boundary was sent to Adèle Labbé on November 15, 2016 and approved on November 17, 2016.

3.3 Wildlife

3.3.1 Incidental Wildlife Observations

All Incidental wildlife observations made outside formal field surveys are presented in *Table 3*. All observations were of single individuals unless otherwise stated. Species with conservation designation are identified on *Figure 1*.

Table 3. Incidental Species Observations

COMMON NAME	SCIENTIFIC NAME	TAXA	DATE - OBSERVATION	SIGNIFICANCE
Eastern Chipmunk	<i>Tamias striatus</i>	Mammal	August 17, 2016 – Observed along the woodland edge within the study area.	<ul style="list-style-type: none"> None

Table 3. Incidental Species Observations

COMMON NAME	SCIENTIFIC NAME	TAXA	DATE - OBSERVATION	SIGNIFICANCE
Red Eared Slider	Trachemys scripta elegans	Reptile	Photographic evidence of a Red Eared Slider at the location of the Norwich Bridge was provided by a Guelph resident.	<ul style="list-style-type: none"> None – non-native

3.3.1.1 Species Listed under the Endangered Species Act

No federally or provincially listed Species at Risk were identified in the study area through background research, provided data, or field observations.

3.4 Significant Wildlife Habitat

With guidance from the *Significant Wildlife Habitat Technical Guide* (2000) and the SWH EcoRegion Criterion Schedule 6E (MNRF 2015b), no Significant Wildlife Habitat (SWH) was identified within the study area (*Appendix 7*) per the SWHTG or the Ecoregion criterion. Significant Wildlife Habitat is present within the study area, per the City of Guelph Official Plan and the MNRF (*Table 4*).

Table 4. Confirmed Significant Wildlife Habitat

SIGNIFICANT WILDLIFE HABITAT TYPE	RATIONALE AND LOCATION
Waterfowl Overwintering	<ul style="list-style-type: none"> The Speed River is a large shallow, open water feature, with areas that remain open during most winters. The Speed River within the Study area is identified as a waterfowl overwintering area by the MNRF and City of Guelph.

3.5 SAR Habitat Assessment

An assessment of all Species at Risk, and species with conservation designation, that have the potential to occur in the study area based on lists provided by the MNRF (2015c), Breeding Bird Atlas, Ontario and Reptile Atlas, Mammal Atlas and the NHIC was completed. Species assessed include all species with Provincial SARO status, Federal SARA status, or an S-Rank of S1-S3. A description of habitat requirements, field studies conducted, and results are provided in *Appendix 8*.

3.6 Aquatic Habitat Assessment

3.6.1 Aquatic Assessment

The aquatic assessment was completed for the stream reach 30m on either side of the existing Norwich Pedestrian Bridge. Digitized field forms for the assessment are provided in *Appendix 9*.

This segment of Speed River is channelized and entrenched, without access to a floodplain. Within the study area, the existing bridge and abutments have altered the watercourse and created a more stable channelized system without meanders.

Within the study area at the time of the survey, the watercourse flow pattern was characterized as 80% slow moving flat pools and glides, with 20% small pool-riffle sequence observed upstream and downstream of the study area limits. Water depth was deepest directly upstream of the bridge, with maximum depth of over 0.5m, downstream of the bridge the water depth varied from approximately 0.5m to 0.3m.

Approximately 10% of the watercourse contained woody debris as in stream cover (i.e. unembedded material with a median axis greater than 100 mm and of sufficient density to block >75% of light.) Limited amounts of large cobble also provide some in stream cover. The substrate was comprised of mostly of fines and gravel, with cobble more abundant in the upper stream reach. The substrate was generally firm, with no identified areas of deep organic material or soft muck.

3.6.1.1 Fish Habitat

The watercourse within the study area is of moderate habitat quality for fish. Cover for fish was present and would provide suitable habitat for small and medium sized fish. Approximately 40% of the stream section is shaded by the riparian cover, which would reduce thermal impacts to fish within the area. Water control structures upstream and downstream, including a weir upstream, adjacent to Joseph Wolfond Park East and the Dam downstream at Wellington Street, create partial barriers, limiting potential fish movement through the watercourse. There are no riverine wetlands and the primary riparian vegetation along this section of the watercourse is overhanging tree limbs. Water temperatures at the time of the Aquatic Habitat Assessment were 21°C; this is a warm to suitable water temperature for cool water fish species.

3.6.2 GRCA Records

Records provided by the GRCA indicate that the Speed River is classified as a Coolwater system, fisheries timing windows specify that no in-water works are permitted from March 15th – June 30th (Pers. Comm. Ashley Rye, GRCA Resource Planner).

GRCA records for fish sampling indicate the presence of 20 identified species in the Speed River between Guelph Lake and the confluence with the Speed River and Eramosa River. Potential full and partial barriers to fish movement, such as dams and weirs, are present within the stream reach for which the fish records were provided. Therefore, all species listed may not be present within the study area. GRCA fish species records are provided in *Appendix 10*.

3.6.3 DFO Self-Assessment for Projects near Water

The Federal *Fisheries Act* requires that projects near watercourses or fish habitat avoid causing serious harm to fish unless authorized to do so. This applies to the proposed repair or replacement of the Norwich Pedestrian Bridge to cross the Speed River.

Detailed construction plans for the proposed bridge have not yet been developed; therefore, a final analysis of impacts could not be completed. Preliminary assessment of the bridge's impact on fisheries habitat has been completed based on the proposed location and anticipated construction methods and impacts. Following detailed design, including grading and erosion and

sediment control plans, a final Fisheries and Oceans Canada (DFO) assessment should be completed to ensure the Fisheries Act (1985) is not contravened.

To determine if the proposed development activity requires DFO Request for Review, a Self-Assessment, and Pathways of Effect analysis were completed based on the information available. Through the analysis, it was determined that construction of the proposed bridge would not require formal DFO Request for Review if the following conditions were met (DFO 2015).

- No temporary or permanent increase in existing footprint¹ below the High Water Mark²
- No new temporary or permanent fill placed below the High Water Mark
- Channel realignment is not required
- No narrowing of the channel
- Any obstruction to fish passage will respect timing windows
- Provides for fish passage
- Work can be done in isolation of flowing water

Based on the proposed bridge location, and anticipated construction activities, it is expected that the above conditions will be met through the repair or reconstruction of a clear-span bridge. It is anticipated that grading and/or the footprint of the bridge will not be at or below the high water mark and will instead use the existing abutments or replacement abutments in similar locations. Therefore, the repair or reconstruction of the proposed bridge would likely not trigger a DFO Request for Review, or DFO Authorization. It is recommended that a DFO Request for Review be completed as part of the detailed design phase if the proposed design does not meet all of the above conditions. Projects that do not need review are still required to avoid causing serious harm to fish and fish habitat. Proper mitigation measures to ensure no impacts to fish should be adhered to, in order to ensure that the Fisheries Act is not contravened.

3.6.4 Assessment of recommended buffers to designated features

Each designated feature has been assessed individually. See *Table 5* for a summary of all recommended buffers.

3.6.4.1 Significant Wildlife Habitat

No minimum buffers have been established through the City of Guelph Official Plan. Within the study area a sized buffer is not recommended to the Significant Wildlife Habitat (Waterfowl Overwintering), the riparian area to each side of the river is the recommended buffer (Figure 1). Where possible, areas naturalized within the riparian corridor for fish will also benefit the Waterfowl Overwintering Habitat.

¹ Footprint: Total area of the bed of a waterbody that is covered by a structure of fill (DFO 2015).

² High Water Mark: The usual or average level to which a body of water rises at its highest point and remains for sufficient time so as to leave a mark on the land (DFO 2015).

3.6.4.2 Surface Water Features and Fish Habitat

Recommended minimum buffers have been established through the City of Guelph Official Plan as 30 metres. Within the study area a 30 metre buffer is precluded in some areas, due to the adjacent developments in proximity to the Speed River. As a result, the recommended buffers vary from approximately 5 metres to 30 metres. Areas adjacent to the Speed River will generally not be permanently altered for the repair or replacement of the pedestrian bridge, areas where vegetation removal must occur for repair or replacement along the speed river are recommended to be naturalized, to provide overhanging vegetation and shading to increase the quality of Fish Habitat in this section of the Speed River.

3.6.4.3 Significant Valleylands

No minimum buffers have been established through the City of Guelph Official Plan. Within the study area a buffer is not recommended to the Significant Valleyland, as existing development precludes it. The pedestrian bridge will be repaired or replaced in its existing location. The Speed River corridor will not be altered for the pedestrian bridge.

3.6.4.4 Significant Woodlands

Recommended minimum buffers have been established through the City of Guelph Official Plan as 10 metres. Within the study area a 10 metre buffer is precluded in some areas, due to the adjacent development in proximity to the Speed River. As a result, the recommended buffer varies from approximately 0 metres (adjacent the parking lot) to 10 metres. Most areas within 10 metres adjacent the Speed River will generally not be permanently altered for the repair or replacement of the pedestrian bridge, areas where vegetation removal must occur for repair or replacement access along the speed river are recommended to be naturalized following construction, construction limits will be determined at detailed design.

Table 5. Recommended Buffers to Designated Features

Natural Heritage Feature	Designation	Recommended minimum Buffer (OP)	Recommended Buffer (EIS)
Significant Wildlife Habitat (Waterfowl Overwintering)	Identified as a waterfowl overwintering area by the MNRF and in the City of Guelph OP.	No minimum buffer	No encroachment into SWH, the riparian habitat within the Valleyland limit is the buffer.
Surface Water Features and Fish Habitat (Cold/cool water fish habitat)	Identified in the City of Guelph OP	30 metres, except where existing development precludes it	No encroachment into the SWH a range of 5-30M buffer is recommended where existing development precludes the 30m buffer.
Significant Valleylands	Identified in the City of Guelph OP	No minimum buffer	No minimum buffer is recommended; clear-span design and placement in existing structure footprint will reduce or eliminate any impacts to the Significant Valleyland.

Table 5. Recommended Buffers to Designated Features

Natural Heritage Feature	Designation	Recommended minimum Buffer (OP)	Recommended Buffer (EIS)
Significant Woodlands	Identified in the City of Guelph OP	10 metres, except where existing development precludes it	Significant Woodlands occur on the west side of the existing structure, the recommended buffer is 10m, with the exception of where existing development precludes it. Due to the existing bridge, and existing parking lot to the north of the significant woodland, some areas are less than 10m.

4.0 Impact Analysis, Mitigation, and Restoration

4.1 Analysis and Comparison of Bridge Alternatives

The proposed repair or replacement of the Norwich Pedestrian Bridge crossing the Speed River has been assessed for impacts to the Natural Heritage System. The bridge is proposed to be repaired or reconstructed in the same location as the existing pedestrian bridge, there are 5 proposed alternatives. Subject to future detailed design, repair or replacement is anticipated to have minor to no impacts on the watercourse and natural features compared to the current conditions. The proposed bridge location is within the Guelph Natural Heritage System for Significant Valleylands, Significant Woodlands, Significant Wildlife Habitat and Cool water Fish Habitat. The extent of tree removal required to accommodate construction of the bridge will be analyzed as part of the Tree Preservation and Compensation Plans (to be provided under separate cover) during detailed design.

Impacts to each natural heritage feature and their functions, and proposed mitigation recommendations to reduce or negate impacts are provided below. An analysis of each bridge alternative is provided in *Table 6*. Monitoring and mitigation of residual effects are also proposed. A detailed description of all potential impacts and mitigation guidelines are provided in *Table 7*.

Trees

A total of forty-four trees were identified within 30m of the bridge. Trees within 30m of the proposed bridge location have the potential to be injured or destroyed, as part of construction activity. During detailed design, a Tree Preservation and Compensation plan will be completed to provide recommendations on preservation or removal and to prescribe protection measures for retained trees. While Manitoba Maple provides some value as overhanging riparian vegetation along the speed river, the removal of Manitoba Maple from within the area of impact, and compensation with native, non-invasive trees is considered a net benefit to the tree community. Compensation for tree removal should occur at a rate of 3:1 in accordance with City policies or as determined through consultation with City Planning staff.

Aquatic Habitat & Fish Passage:

The Speed River in the study area is classified as cool water fish habitat. Impacts to aquatic habitat could include sedimentation from construction, construction below the high water mark, impacts to fish habitat and water quality changes due to pedestrian bridge maintenance and repair. The flow and characteristics of the watercourse will not be altered by the pedestrian bridge, as the bridge abutments will not be altered from the existing footprint. The removal of invasive species and restoration of riparian habitat where possible along the speed river will serve to improve fish habitat by providing cover within this reach of the speed river, and is an overall benefit.

Vegetation:

The majority of the herbaceous vegetation to be removed is temporary, and consists of non-native and weedy herbaceous species. Removal of invasive species and restoration of riparian areas will provide an overall benefit to vegetation in the area of the pedestrian bridge.

Significant Wildlife Habitat:

The Speed River is identified as a Waterfowl Overwintering area, species that have been observed in the River, and adjacent riparian area include Mallard and Canada Goose. Both species are considered tolerant to humans, and development disturbance in the short term. The repair or replacement of the Norwich Bridge is unlikely to permanently impact this habitat, as it is an existing structure.

Species at Risk:

No Species at Risk listed as Threatened or Endangered or their regulated habitat were identified in the study area.

Wildlife & Wildlife Habitat:

Potential wildlife impacts generally include the potential to harm or harass migratory birds during the migratory bird nesting season and wandering wildlife within the construction area.

Recommended mitigation for these impacts include the avoidance of any clearing, construction or grading during the general nesting season (April 1st -August 31st) where possible, and the clear delineation of the work space through the installation of silt and sediment and tree protection fencing to avoid potential entry by wandering wildlife.

Significant Valleylands:






Valleylands occur to either side of the Speed River. Impacts to valleylands include the potential for increased erosion on slopes adjacent to the Speed River during construction, impacts to unstable landforms and potential loss of stabilizing roots from trees that may require removal. The restoration of riparian vegetation after construction may provide a benefit to valleylands, through the installation of vegetation to provide greater slope stabilization.

Table 6. Comparison and rating of Impacts to Natural Heritage by Alternative

Factor/ Criteria	Alternative 1 – <i>sympathetic rehabilitation of the existing Bridge</i>	Alternative 2 – <i>Installation of a New bridge structure between existing trusses</i>	Alternative 3 – <i>Sympathetic replacement of the existing bridge</i>	Alternative 4 – <i>Bridge removal (without replacement)</i>	Alternative 5 <i>Do Nothing</i>
Trees	44 trees were identified within 30 m of the existing bridge location. Impacts to be determined at detailed design.	44 trees were identified within 30 m of the existing bridge location. Impacts to be determined at detailed design.	44 trees were identified within 30 m of the existing bridge location. Impacts to be determined at detailed design.	44 trees were identified within 30 m of the existing bridge location. Impacts to be determined at detailed design.	0 Trees will be affected.

Table 6. Comparison and rating of Impacts to Natural Heritage by Alternative

Factor/ Criteria	Alternative 1 – sympathetic rehabilitation of the existing Bridge	Alternative 2 – Installation of a New bridge structure between existing trusses	Alternative 3 – Sympathetic replacement of the existing bridge	Alternative 4 – Bridge removal (without replacement)	Alternative 5 Do Nothing
Aquatic Habitat and Fish Passage	No impact to floodlines, channel processes or fish movement potential. Provided the bridge location remains in situ.	No impact to floodlines, channel processes or fish movement potential, provided the bridge location remains in situ.	No impact to floodlines, channel processes or fish movement potential, provided the bridge location remains in situ.	No impact to floodlines, channel processes or fish movement potential, provided that abutments are not removed.	No impact to floodlines, channel processes or fish movement potential.
Vegetation	Some naturalized vegetation is anticipated to require removal for access to the existing bridge structure.	Some naturalized vegetation is anticipated to require removal for access to the existing bridge structure.	Some naturalized vegetation is anticipated to require removal for access to the existing bridge structure. Removal of old bridge and installation of new bridge may impact a larger vegetated area.	Some naturalized vegetation is anticipated to require removal. Removal of the bridge may impact a larger area, depending on removal method.	Vegetation will not be removed. No restoration or invasive species management will occur.
Significant Wildlife Habitat	No impacts to the River corridor, or adjacent riparian area are anticipated, no impacts to SWH are expected.	No impacts to the River corridor, or adjacent riparian area are anticipated, no impacts to SWH are expected.	No impacts to the River corridor are anticipated, changes to riparian slopes, and abutments within valleyland are not permitted in SWH.	No impacts to the River corridor, or adjacent riparian area are anticipated, no impacts to SWH are expected. Removal of bridge may provide a benefit to the river corridor.	No impacts to SWH
Species at Risk	No impacts to SAR are anticipated outside of the breeding bird window. May provide nesting habitat for SAR birds, should they occur.	No impacts to SAR are anticipated outside of the breeding bird window. May provide nesting habitat for SAR birds, should they occur.	No impacts to SAR are anticipated outside of the breeding bird window. May provide nesting habitat for SAR birds, should they occur.	Impacts to SAR may occur. May permanently remove nesting habitat for SAR birds, should they occur.	No immediate impacts to SAR birds are anticipated.

Table 6. Comparison and rating of Impacts to Natural Heritage by Alternative					
Factor/ Criteria	Alternative 1 – sympathetic rehabilitation of the existing Bridge	Alternative 2 – Installation of a New bridge structure between existing trusses	Alternative 3 – Sympathetic replacement of the existing bridge	Alternative 4 – Bridge removal (without replacement)	Alternative 5 Do Nothing
Wildlife & Wildlife Habitat	No impacts to Wildlife & Wildlife habitat are anticipated. Restoration & invasive species management plan will provide improvements to degraded habitat.	No impacts to Wildlife & Wildlife habitat are anticipated. Restoration & invasive species management plan will provide improvements to degraded habitat.	No impacts to Wildlife & Wildlife habitat are anticipated. Restoration & invasive species management plan will provide improvements to degraded habitat.	No impacts to Wildlife & Wildlife habitat are anticipated. Restoration & invasive species management plan will provide improvements to degraded habitat.	No impacts to Wildlife & Wildlife habitat. No improvements to degraded habitat.
Significant Valleylands	No changes in impact to significant valleylands are anticipated, provided the bridge location remains in situ.	No changes in impact to significant valleylands are anticipated, provided the bridge location remains in situ.	No changes in impact to significant valleylands are anticipated, provided the bridge location remains in situ.	No changes in impact to significant valleylands are anticipated.	No changes in impact to significant valleylands are anticipated.
Ranking					

4.2 Generalized Impact Assessment and Mitigation

Repair or reconstruction of the proposed Norwich Pedestrian Bridge will result in impacts to the existing natural features. An assessment of the generalized impacts (potential and actual) and mitigation measures are provided in *Table 7*. A Glossary of terms and impact ratings is found in *Appendix 11*.

Table 7. Development Impacts and Mitigation Guidelines													
Phase	Activity	Potential Impacts	Duration of Impact	Reversibility	Geographic level of influence	Frequency	Ecological Site Context	Likelihood of Occurring	Cumulative Effects?	Potential Impact Rating	Mitigation Recommendations / Comments	Final Impact Rating	Monitoring & Follow-up Recommendations
Site Preparation	Vegetation Removal – Clearing & Grubbing	<ul style="list-style-type: none"> Loss of vegetation and wildlife habitat 	ST	R	SA	O	PD	M	Y	Minor	<ul style="list-style-type: none"> Establish and maintain buffers around significant features Incorporate design to avoid or minimize loss of vegetation and edge habitat Minimize vegetation removal on slopes Designate construction staging and vehicle access areas outside of established designated natural areas and isolate with ESC measures 	None	<ul style="list-style-type: none"> Monitor for successful establishment of native plant communities. Adapt Integrative Pest Management Plan as needed to control exotic species.
		<ul style="list-style-type: none"> Loss of woodland habitat Loss of Tree cover 	ST	R	SA	O	PD	L	Y	Minor	<ul style="list-style-type: none"> Revegetate areas with native species after site preparation Implement Restoration plan Compensate for Trees removed at a 3:1 ratio 	None	<ul style="list-style-type: none"> Monitor for successful establishment of native plant communities. Adapt Integrative Pest Management Plan as needed to control exotic species.

Site Preparation (cont.)	Vegetation Removal – Clearing & Grubbing	<ul style="list-style-type: none"> Disturbance of fish and wildlife species 	ST	R	SA	O	PD	L	Y	Minor	<ul style="list-style-type: none"> Time activities to avoid wildlife disturbance during critical life stages. Follow MNRF timing window of no in-water works from March 15th – June 30th. 	Minor - None	
		<ul style="list-style-type: none"> Impacts to Nesting Birds Protected under the Migratory Bird Convention Act 	ST	R	SA	O	PD	M	Y	Minor	<ul style="list-style-type: none"> Any tree and vegetation removals must be in compliance with the Migratory Birds Convention Act. Removals must take place outside of the general nesting period (April 1 - August 31) for the Lower Great Lakes /St. Lawrence Plain Bird Conservation Region of Ontario. Due to the existing dense vegetation on site Environment and Climate Change Canada advises against the removal of vegetation during the general nesting period, even with a nest search carried out by a skilled and experienced observer. 	Minor - None	
		<ul style="list-style-type: none"> Reduced vegetation diversity 	ST	R	SA	O	PD	L	N	Minor	<ul style="list-style-type: none"> Revegetate areas with native species after site preparation 	None	
	Grading	<ul style="list-style-type: none"> Increased erosion, sedimentation, and turbidity Increase nutrient inputs and contaminants to watercourse and wetlands 	ST	R	AA	O	PD	M	Y	Moderate	<ul style="list-style-type: none"> Maintain or restore vegetative buffers Develop & implement ESC plan 	None	<ul style="list-style-type: none"> Monitor ESC fencing Monitor for successful establishment of native plant communities.
		<ul style="list-style-type: none"> Increased soil compaction 	ST	R	SA	O	PD	L	Y	Moderate	<ul style="list-style-type: none"> Control access and movement of equipment and people Minimize the use of heavy equipment in sensitive areas Construction equipment limited to the construction allowance area 	None	

Site Preparation (cont.)	Grading										and not encroach within the adjacent woodland or wetland		
		• Changes to drainage • Changes to surface runoff	ST	R	SA	O	PD	M	Y	Moderate	• Minimize changes to land contours and natural drainage • Maintain streams and timing, quantity of flows	Minor-None	
		• Changes in soil moisture, vegetation	ST	R	SA	O	PD	L	N	Minor	• Minimize the area and duration of soil exposure	None	
		• Disturbance to wildlife	ST	R	SA	O	PD	L	N	Minor	• Conduct work outside timing windows of sensitive species or periods	Minor-None	
		• Wildlife Entering Construction Areas	ST	R	SA	O	PD	L	N	Minor	• Implementation of ESC fence to minimize wildlife wandering	Minor-None	
Construction	Bridge Construction	• Increased erosion, sedimentation, and turbidity	ST	R	SA	S	PD	H	Y	Minor	• Maintain vegetated buffers • Develop sediment and erosion control plan • Maintain or provide vegetative buffers	None	• Monitor for successful establishment of native plant communities.
		• Water contamination by oils, gasoline, grease, and other materials	ST	R	SA	S	PD	H	Y	Moderate	• Control water contamination through the implementation of an ESC plan following guidelines provided in the "Greater Golden Horseshoe Area Conservation Authorities' Erosion and Sediment Control Guideline for Urban Construction".	Minor-None	
		• Loss of vegetation and removal of dead trees for user safety	ST	R	SA	O	PD	M	N	Minor	• Revegetate areas with native species • Compensate for Dead Tree Loss	None	• Monitor for successful establishment of native plant communities.
		• Disturbance to Wildlife from sounds and activity associated with construction.	ST	R	SA	O	PD	L	N	Minor	• Time activities to avoid sensitive wildlife periods	Minor-None	
Post-Construction	Operation/Maintenance	• Water quality impacts from de-icing procedures • Pollution from regular	LT	A	LA	S	PD	M	Y	Moderate	• Limit salt or de-icing solution on bridge and use alternative 'eco' solutions (e.g. Beet juice). • Limit any cleaning solutions or	Minor	

Post-Construction (Cont.)		maintenance and use.									paint used on the bridge and take appropriate precautions to avoid products entering the watercourse.		
	Recreation Activities (e.g. walking, cycling, fishing) Recreation Activities (e.g. walking, cycling, fishing)	• Increased erosion, sedimentation and turbidity to waterbodies	LT	P	SA	C	PD	L	Y	Minor	• Choose designs and materials that will minimize impacts • Minimize erosion by using gravel, stones or wood on paths	Minor-None	
		• Trampling of vegetation	LT	P	AA	M	PD	M	Y	Minor	• Restrict access to natural areas • Restrict access to designated access points • Encourage users to remain on the walkway and keep dogs leashed, through installation of signs • Install site-specific educational signage to inform users of the significance/sensitivity of the natural features	Minor-None	
		• Disturbance to wildlife during critical life stages	LT	P	AA	M	PD	M	Y	Moderate	• Provide clearly marked walkway away from sensitive features and wildlife habitat	None	
		• Attraction of some wildlife species and scavengers due to human activities, including garbage causing increased human-wildlife interactions	LT	P	AA	M	PD	M	Y	Minor	• Provide appropriate garbage receptacles along the pedestrian walkway and ensure regular maintenance by City parks staff.	Minor-none	

4.3 Hydrological Function and Changes to Watercourse

A detailed hydrological study and analysis of the functions and anticipated changes to the watercourses have not been completed. However, it is expected that repairs or reconstruction of the Norwich Pedestrian Bridge, in the same location as the existing bridge, would have little to no impact on the hydrology of the watercourse or flood risk.

4.4 Restoration, Compensation and Invasive Species Management Strategy

Construction work on the Norwich bridge location could result in impacts to the natural features within the study area. In order to mitigate impacts, a comprehensive restoration, compensation and invasive species management plan should be developed as part of the detailed design and implemented in conjunction with bridge construction. This will help to ensure the re-establishment of native plant communities following construction and limit the likelihood of invasive species becoming dominant within the newly disturbed areas.

A detailed, balanced landscape restoration plan that considers site-specific conditions, constructability and cost should be developed and implemented during detailed design. The goals of restoration should be to increase native vegetation communities, reduce invasive exotic vegetation, increase diversity and enhance wildlife habitat. Potential methods that could be used to achieve the goals of restoration include, but are not limited to:

- Site Preparation
 - Control existing invasive exotic vegetation using an Integrated Pest Management approach.
 - Migratory birds are to be protected per the Migratory Breeding Bird Convention Act. No construction, tree removal or site preparation work is to occur during the generalized nesting period of April 1 to August 31.
 - Amend soils to meet specific vegetation community needs.
- Seeding and Planting
 - Identify existing native species suitable for salvage;
 - Seeding and planting native species to establish a mosaic of targeted vegetation communities.
- Wildlife Habitat Enhancement
 - Create habitat features and structures for target wildlife species (e.g. woody debris, nesting tubes, nesting boxes etc.).
- Short-Term Management
 - Monitoring the establishment of seeded and planted native species and adapting establishment maintenance requirements
 - Continued control of invasive exotic vegetation using an Integrated Pest Management approach and adapting methods/frequency to meet control targets.
 - Implementing a Sediment and Erosion Control Plan

In addition to restoration actions, The City of Guelph typically requires compensation for removed native trees with a DBH of 10cm or greater. This is regulated by the *Private Tree Protection By-law (2010) – 19058* ('the By-law'). Removal of trees under the By-law requires

permission from the City and may be subject to conditions, including compensation in the form of replacement trees. Trees within 30m of the bridge location are comprised of both municipal trees and private trees. Municipal trees are not covered under the *By-law*. Requirements for compensation of removed trees, but should be at a 3:1 ratio, per management direction on recent City projects completed by Aboud & Associates in 2016, or as determined through consultation with City staff.

Implementing a comprehensive restoration plan within the area impacted by the bridge will improve the ecological value of the natural feature relative to the current partial degraded state and reduce impacts from the existing invasive species. Specific opportunities for restoration and invasive species management should be investigated with City of Guelph Park and Environmental staff at detailed design.

5.0 Legislation and Policy Compliance

5.1 Provincial Policy Statement

The proposed pedestrian bridge is considered essential transportation infrastructure and is, therefore, exempt from the constraints applied to development under the PPS. The natural resources within the zone of impact from the proposed pedestrian bridge must still be given consideration, and impacts minimized where possible. To fulfill the requirement under the PPS, natural features were inventoried and assessed for potential and actual impacts from the proposed bridge construction. Each alternative was assessed to ensure that the final location had consideration for creating the least impact to the natural heritage resources on site.

5.2 Endangered Species Act.

No species listed as Threatened or Endangered under the ESA were observed within the study area. One species, Common Snapping Turtle is listed as Special Concern and is known to occur within the Speed River. Common Snapping Turtles are not afforded general habitat protection. Overwintering habitat for Common Snapping Turtle was not observed within the study area. Authorization under the ESA is not required for the construction of the pedestrian bridge.

5.3 Fisheries Act, 1985

In order to ensure compliance with the *Fisheries Act*, a DFO Self-Assessment or DFO Request for Review of the detailed design should be completed by a qualified biologist to ensure compliance under the *Fisheries Act*, 1985. If it is determined that proposed actions may cause serious harm to fish that cannot be mitigated for, then a Fisheries Act Authorization would be required.

5.4 Grand River Conservation Authority

The proposed bridge is within the Flooding Hazard Limit and regulatory allowance. The proposed pedestrian bridge meets GRCA Policy, as it is considered Public Infrastructure and crossings. Public Infrastructure is permitted in Riverine Flooding Hazard lands provided there is no feasible alternative outside of the Hazard. The proposed bridge must limit adverse hydraulic or fluvial impacts, ensure no loss of flood storage wherever possible, and where unavoidable, minimize intrusions on significant natural features or hydraulic or ecological functions.

The repair or replacement of the Norwich Pedestrian Bridge crossing is proposed to be located in the same location as the existing bridge. This area is already impacted by the existing bridge and new impacts in natural heritage features will be minor to none. Hydrological impacts to the watercourse and changes to flood capacity should be minimized through detailed design. Appropriate mitigation measures should be applied through design and construction planning and disturbed areas restored or enhanced.

Any alteration to the channel alignment will require permission from the GRCA.

5.5 City of Guelph Official Plan

The proposed Norwich Pedestrian Bridge is considered essential transportation infrastructure and is permitted under the Guelph OP.

5.5.1 Natural Heritage System

The bridge is proposed to be repaired or rebuilt and will be located in the location of an existing bridge, since the bridge is a legally existing building, structure or use, it is permitted within the Natural Heritage System. Areas of disturbance will be kept to a minimum through utilization of an existing crossing. A tree protection fence is to be installed to delineate the zone of impact and to protect natural heritage features. Appropriate mitigation measures should be applied through design and construction planning and disturbed areas restored or enhanced.

5.5.1.1 Surface Water Features and Fish Habitat

Any construction within or across surface water features or fish habitat must occur during the appropriate MNRF fisheries timing window to avoid or minimize impacts on fish, wildlife, and water quality; and implement best management practices during construction.

All in-water works and construction activity that could impact fish habitat will be completed during the appropriated in water works timing window of no in-water works permitted from March 15th – June 30th (Pers. Comm. Ashley Rye, GRCA Resource Planner).

A restoration and compensation plan that includes the installation of riparian plants to provide cover over the watercourse would improve fisheries habitat within this reach, as would the removal of partial or full barriers where possible.

Impacts to the watercourse and fish habitat will be mitigated for through detailed design. The project will be reviewed to ensure compliance with the Fisheries Act, 1985.

5.5.1.1 Significant Woodlands

The repair or reconstruction of the pedestrian bridge is permitted within Significant Woodlands or their minimum buffers, under Sections 6A. The existing bridge is considered an existing structure, and any proposed expansion will be minor in proportion to the size and scale of the use, the existing use is as a pedestrian bridge, no intensification of use is anticipated. Provided that works are located as far from the feature boundaries as possible, the disturbance is minimized and that disturbed areas and buffers are revegetated with appropriate native species wherever opportunities exist.

5.5.1.2 Significant Valleylands

The repair or reconstruction of the pedestrian bridge is permitted within Significant Valleylands. Areas disturbed within the Significant Valleylands will be restored and naturalized through a comprehensive restoration and invasive species management plan as part of the detailed design. This will promote bank stabilization and enhance wildlife habitat within the Significant

Valleylands. As such, the proposed infrastructure project meets the policy requirements for Significant Valleylands.

5.5.1.3 Ecological Linkages

The implementation of a restoration and compensation plan along the riparian corridor in the study area, and removal of invasive species will enhance the wildlife habitat and the ecological linkage within the Speed River corridor, meeting the policy of the OP.

5.5.1.4 Significant Wildlife Habitat

The watercourse is considered Significant Wildlife Habitat for Waterfowl Overwintering. Essential Transportation infrastructure is not identified as an additional permitted use within significant wildlife habitat or their established buffers. However, the Norwich Bridge is considered a legally existing use, building or structure. Provided that any proposed expansion will be minor in proportion to the size and scale of the use and no intensification of use are anticipated, it is permitted within Significant Wildlife Habitat. By choosing alternatives that do not impact any of the exiting valleyland slopes, and are placed at existing infrastructure, the habitat will be further protected meeting the policies of the OP.

5.5.1.6 Urban Forest

Areas disturbed by vegetation and tree removal shall be restored and compensated for through planting of appropriate native species, resulting in enhancement of the Urban Forest compared to the current condition.

As a result, the proposed Norwich bridge will not negatively impact the City's Urban Forest or its ecological function but would provide ecological benefit to the woodland community through compensation planting as required.

5.5.2 City of Guelph By-laws

Any tree removal (trees >10cm DBH) will be subject to the City of Guelph Tree By-law. Where the City is undertaking infrastructure work, healthy non-invasive trees within the urban forest will be retained to the fullest extent possible. Where regulated trees are damaged or destroyed a Tree Preservation and Vegetation Compensation Plan is needed.

A tree inventory and Tree Preservation Plan will be provided under separate cover.

6.0 Summary and Conclusions

It is our opinion that through implementing the mitigation measures identified in *Table 7* and in *Section 4*, the proposed repair or replacement of the Norwich Pedestrian Bridge will result in no significant long-term negative impacts to natural heritage features identified within and adjacent to the proposed bridge location. The natural features within the study area will be protected and enhanced through mitigation and restoration recommendations. This will result in long-term positive effects on the natural heritage features within the study area. Below is a summary of the affected natural heritage features, constraints, and impacts. Recommendations for associated mitigation and/or protection measures are identified in *Section 4*.

6.1 Biological Studies and Site Constraints

1. Surveys were conducted for Ecological Land Classification and Vegetation Communities (ELC and Vascular Plant List), Significant Wildlife Habitat, Species at Risk Habitat Assessment, Aquatic Habitat Assessment, and a Tree Inventory.
2. Significant Wildlife Habitat (Waterfowl Overwintering) occurs within the study area, as identified by the Ministry of Natural Resources and Forestry and the City of Guelph Official Plan, Natural Heritage Policies.
3. Significant Wildlife Habitat (Turtle Overwintering) likely occurs within the Speed River, but was not identified within the study area.
4. The study area includes Cool water fish habitat.
5. The study area is within the One Zone Floodplain and Regulatory Floodway.

6.2 Impact Assessment

1. Potential impacts from the construction of the bridge were assessed to determine the extent, and mitigation guidelines have been provided (*Table 7*).
2. Impacts primarily involve the potential removal of trees, naturalized weedy herbaceous vegetation communities, site grading and wildlife disturbance.
3. Trees close to the bridge location and in impacted areas along the watercourse edge may require an assessment of stability for the retained trees and may include some selective tree removal and pruning.
4. There are opportunities in the study area for edge enhancement, restoration, invasive species management and compensation planting to mitigate and offset potential impacts.

6.3 Legislation and Policy Compliance

1. Under the City of Guelph OP, the repair or replacement of the Norwich Pedestrian Bridge, considered essential transportation infrastructure, is permitted within the Onezone Floodplain, Floodway, Fish Habitat, Significant Valleylands, Significant Woodlands and Urban Forest under OP Section 6A.1.2(7)(8). Essential Transportation infrastructure is not permitted within Significant Wildlife Habitat; however, the Norwich Bridge is considered a legally existing use, building or structure. Provided that any proposed expansion will be minor in proportion to the size and scale of the use and no intensification of use are anticipated, it is permitted within Significant Wildlife Habitat and Significant Woodlands, and their buffers. Under the OP, infrastructure works permitted within the Natural Heritage System or associated buffers are required to be located as far from the feature boundaries as possible, minimize disturbance, and to re-vegetate with appropriate native species wherever opportunities exist within the disturbed natural heritage features and buffers. It is our opinion that through the implementation of mitigation and restoration measures described, there will be no negative effects to the One zone Floodplain, Floodway, Fish Habitat, Significant Valleylands, Significant Woodlands, Significant Wildlife Habitat or the Urban Forest from the proposed bridge works. Recommended mitigation, restoration and compensation measures will provide an overall positive benefit to the natural heritage features.
2. The proposed repair or replacement of the Norwich Pedestrian Bridge is permitted in accordance with GRCA's *Policies for the Administration of the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation* (Ontario Regulation 150/06, 2013). The repair or replacement of the proposed pedestrian bridge meets GRCA Policy, as they are considered public infrastructure and crossings, rather than development. Public infrastructure is permitted in Riverine Flooding Hazard lands provided there is no feasible alternative outside of the Hazard. The proposed bridge must limit adverse hydraulic or fluvial impacts, ensure no loss of flood storage wherever possible, and where unavoidable, minimize intrusions on significant natural features or hydraulic or ecological functions. Appropriate design and mitigation measure can ensure the above conditions are met. Therefore the proposed infrastructure complies with GRCA's wetland policies.

Any alteration to the channel alignment will require permission from the GRCA.

7.0 Avoidance, Mitigation and Compensation Recommendations

The following recommendations are provided to ensure protection and maintenance of natural heritage features and function within and adjacent the proposed pedestrian bridge. Through the implementation of the proposed mitigation, restoration, and compensation, no negative impacts are expected to the natural heritage system.

1. Prepare and implement an Erosion and Sediment Control Plan (ESC) following guidelines provided in the “Greater Golden Horseshoe Area Conservation Authorities’ Erosion and Sediment Control Guideline for Urban Construction” as part of detailed design.
2. Install and monitor a, silt and sediment control barrier
 - a) Silt fence to be inspected weekly during construction and following a storm event of 25mm of rainfall within 24 hours.
3. ESC measures to be kept in place until bridge construction is completed and disturbed soils have been vegetated.
4. The area of construction disturbance shall be kept to a minimum.
5. Control access and movement of equipment and people.
6. Minimize the use of heavy equipment in sensitive areas.
7. Works are to be located as far away from the feature boundary as possible.
8. Equipment is to be limited to the construction allowance area and is not to encroach within the adjacent Significant Woodland, urban forest or watercourse.
9. Accumulated sediment and debris is to be removed before silt fence is removed.
10. All disturbed areas will be re-vegetated or restored with site appropriate indigenous plants wherever opportunities exist.
11. Implement a comprehensive Restoration, Compensation and Invasive Species Management plan after site preparation within the areas of impact associated with the construction of the bridge during detailed design.
12. Complete an investigation of the existing bridge during the core breeding bird period (May 15-July 31 2017) to determine if any birds are nesting, or have nested on the existing structure in order to ensure compliance with the migratory bird act, and examine for SAR bird habitat.

13. Time activities to avoid wildlife disturbance during critical life stages:

- a) No in-water works are permitted from March 15th to June 30th as per GRCA fisheries timing window for cool water systems.
- b) Avoid removal of trees and vegetation during the generalized breeding bird nesting period from April 1 to August 31. If removal of vegetation is to occur during the general nesting period, a nest search should be carried out by a skilled and experienced Biologist.

14. Compensate for trees removed at a 3:1 ratio.

15. Choose designs and materials that will minimize impacts.

16. Ensure the trail design to the bridge is located away from sensitive features.

17. The use of pervious materials (gravel, stone dust or wood chips) for any connecting trail surfaces is recommended.

18. Include educational signage (site-specific) and informative signage (i.e., no off-leash dogs).

Prepared by:

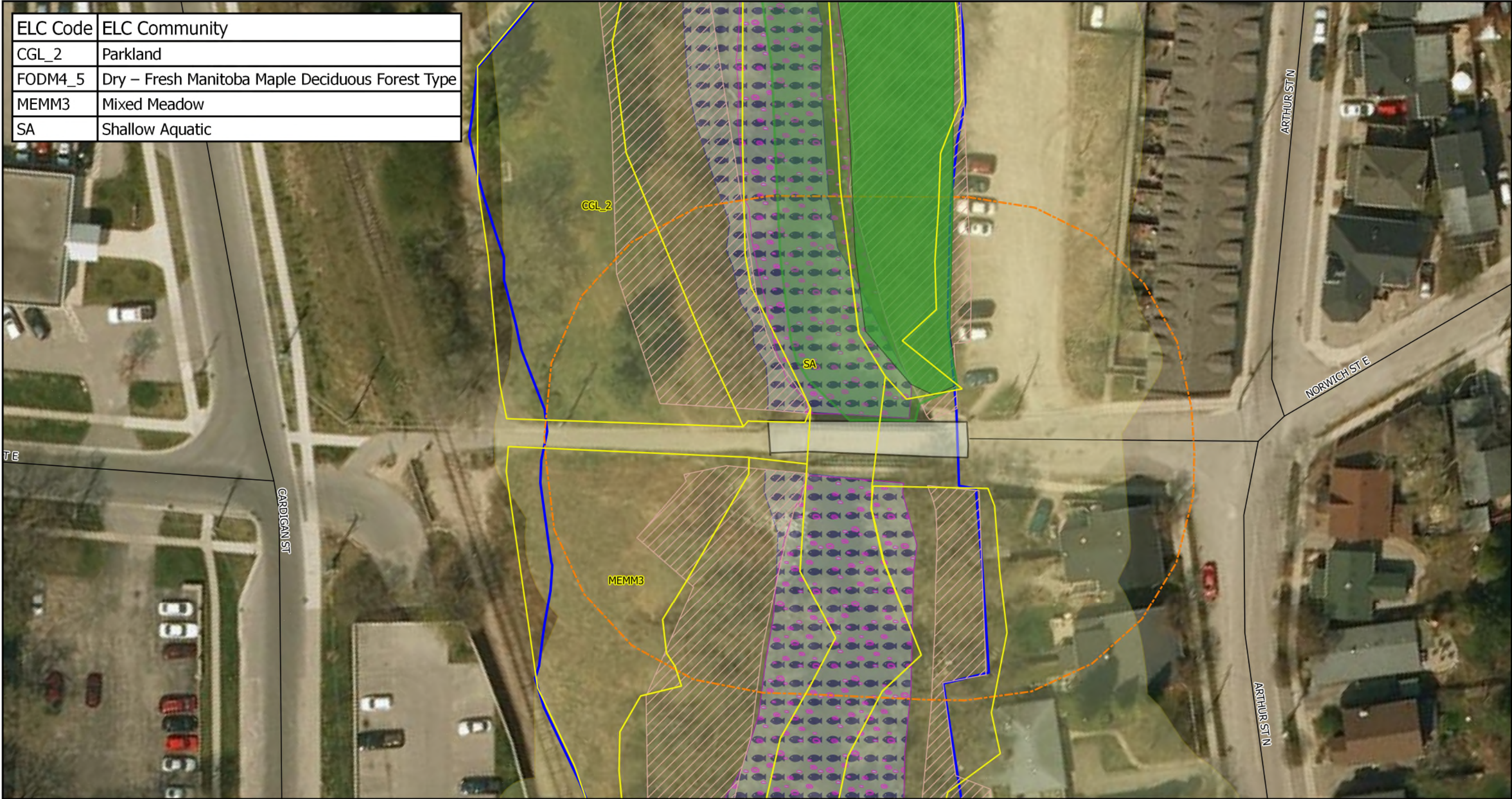
ABOUD & ASSOCIATES INC.



Ryan Hamelin, M.Sc.
Terrestrial and Wetland Ecologist



Cheryl-Anne Ross, B. Sc.
Ecology Lead & Wildlife Ecologist
ISA Certified Arborist ON-2017A



ELC Code	ELC Community
CGL_2	Parkland
FODM4_5	Dry – Fresh Manitoba Maple Deciduous Forest Type
MEMM3	Mixed Meadow
SA	Shallow Aquatic

Legend

STUDY AREA

REGULATION LIMIT

BRIDGE LOCATION

ECOLOGICAL LAND CLASSIFICATION (ELC)

SIGNIFICANT VALLEYLANDS

SIGNIFICANT WILDLIFE HABITAT

COOL WATER FISH HABITAT

COOL WATER FISH HABITAT BUFFER

SIGNIFICANT WOODLAND

SIGNIFICANT WOODLAND BUFFER

Sources:

1. Orthophotography - FBS WMTS online, 2010

2. Ecological Land Classification, Mapped by Aboud & Associate Inc. on August 17, 2016

3. Grand River Conservation Authority Regulation Limits Provided by GRCA, 2016

4. Floodway, Provided by City of Guelph, 2015

5. Significant Woodland, Mapped by Aboud & Associate Inc. on August 17, 2016

6. Roads, Provided by Land Information Ontario (LIO) Accessed 2016.

Title:

Study Area & Natural Heritage Features
Norwich Pedestrian Bridge

Project:

Guelph Pedestrian Bridge EIS
Guelph, ON

Date:

March 2017

Project:

AA16 - 047A

Scale:

1 : 500

ABOUD & ASSOCIATES INC.

Consulting Arborists • Ecologists • Landscape Designers

591 Woolwich Street • Guelph • Ontario • Canada • N1H 3Y5

T: 519.822.6839 • F: 519.822.4052 • info@abouding.com • www.abouding.com

Figure No:

1



LEGEND

- TREE SURVEY AREA (30m zone)
- BRIDGE LOCATION
- SIGNIFICANT WOODLAND
- TREE POINTS
- MTPZ

Sources:
 1. Orthophotography - FBS WMTS online, 2010
 2. Trees inventoried and surveyed by Aboud & Associate Inc. on October 12, 2016
 3. Significant Woodland, Mapped by Aboud & Associate Inc. on August 17, 2016
 4. Roads, Provided by Land Information Ontario (LIO) Accessed 2016.

Title:
Tree Survey - Norwich

Project:
**Guelph Pedestrian Bridge EIS
 Guelph, ON**

Date: October 2016
 Project: AA16 - 047A
 Scale: 1 : 500



ABOUT & ASSOCIATES INC.
 Consulting Arborists • Ecologists • Landscape Designers
 591 Woolwich Street - Guelph - Ontario - Canada N1H 3Y5
 T: 519.822.6839 F: 519.822.4052 info@abouding.com www.abouding.com

Figure No: **2**

8.0 References

- Bird Studies Canada. 2001. Ontario Breeding Bird Atlas: Guide for Participants. Bird Studies Canada in cooperation with Environmental Canada (Canadian Wildlife Service), Federation of Ontario Field Naturalists, Ontario Field Ornithologists, Ontario Ministry of Natural Resources.
- Cadman, M.D., D.A. Sutherland, G.G. Beck, D. Lepage, and A.R. Couturier. 2007. The Atlas of the Breeding Birds Ontario 2001-2005. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto, xxii + 706pp.
- COSEWIC 2002a. COSEWIC assessment and status report on the northern map turtle *Graptemys geographica* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 34 pp.
- COSEWIC 2002b. COSEWIC assessment and status report on the eastern ribbonsnake *Thamnophis sauritus*. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 24 pp.
- COSEWIC. 2008. COSEWIC assessment and status report on the Snapping Turtle *Chelydra serpentina* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 47 pp. Available at: (www.sararegistry.gc.ca/status/status_e.cfm).
- COSEWIC. 2010. COSEWIC assessment and status report on the Rusty-patched Bumble Bee *Bombus affinis* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 34 pp.
- Dobbyn, John. 1994. Atlas of the Mammals of Ontario. Federation of Ontario Naturalists,
- Dougan & Associates, with Sneil & Cecile Environmental Research. 2009. List of Significant Wildlife in Wellington County; In City of Guelph Natural Heritage Strategy - Phase 2: Terrestrial Inventory & Natural Heritage System (VOL. 2 – APPENDICES). Final Report March 2009.
- Fisheries Act, 1985. R.S.C., 1985, c. F-14
- GRCA. 2013. Grand River Conservation Authority. *Grand River Information Network*. Available at: <http://www.grandriver.ca/index/document.cfm?sec=63&sub1=0&sub2=0>
- Lee H.T. 2008. Southern Ontario Ecological Land Classification – Vegetation Type List Ontario Ministry of Natural Resources.
- Lee, H.T., W.D. Bakowsky, J.L. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurphy. 1998. Ecological Land Classification for Southern Ontario: First Approximation and its Application. Ontario Ministry of Natural Resources, Southcentral Science Section. Science Development and Transfer Branch. SCSS Field Guide FG-02

- MNRF. 2000. Ontario Ministry of Natural Resources. *Significant Wildlife Habitat Technical Guide*. October 2000.
- MNRF. 2010. Ontario Ministry of Natural Resources. *Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005*. Second Edition. Toronto: Queen's Printer for Ontario.
- MNRF. 2015a. Ontario Ministry of Natural Resources. Ontario Species at Risk website. Available at: <http://www.mnr.gov.on.ca/en/Business/Species/index.html>
- MNRF. 2015b. Significant Wildlife Habitat Ecoregion 6E Criteria Guide. Ministry of Natural Resources and Forestry. Regional Operations Division, Peterborough Ontario, January, 2015.
- MNRF. 2015c. Wellington County Upper Tier Species at Risk. Ministry of Natural Resources and Forestry. Provided by Guelph District MNRF, February, 2015.
- Mortarello, S., Mike Barry, M., Gann G., Zahina, J., Channon, S., Hilsenbeck, C., Scofield, D., Wilder, G., and Wilhelm, G. 2012. Coefficients of Conservatism Values and the Floristic Quality Index for the Vascular Plants of South Florida. *Southeastern Naturalist*. Volume 11(Monograph 3):1–62.
- NatureServe. 2015. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://explorer.natureserve.org>. (Accessed: October 11, 2016)
- NHIC. 2015. Natural Heritage Information Centre. *NHIC online database and mapping*. Ontario Ministry of Natural Resources. Available at: <https://www.ontario.ca/environment-and-energy/natural-heritage-information-centre>
- Official Plan 2014. City of Guelph Official Plan 2001. September 2014 Consolidation. City of Guelph.
- OMMHA. 2014. Ontario Ministry of Municipal Affairs and Housing. *Ontario Provincial Policy Statement*. April 30, 2014.
- Ontario Nature. 2016. Ontario Reptile and Amphibian Atlas. Available at: http://www.ontarionature.org/protect/species/herpetofaunal_atlas.php
- SARA 2014. Federal Species at Risk Registry. Government of Canada. Available at http://www.registrelep-sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=110
- VASCAN. 2015. Database of Vascular Plants of Canada (VASCAN). Université de Montréal Biodiversity Centre. Version 36. Published September 24, 2015.

Agency Correspondence

Nix, April. Environmental Planner. City of Guelph. Email correspondence.

Labbè, Adèle. Environmental Planner. City of Guelph. Email and phone correspondence.

Rye, Ashley. Resource Planner – North. Grand River Conservation Authority. Email and phone correspondence.

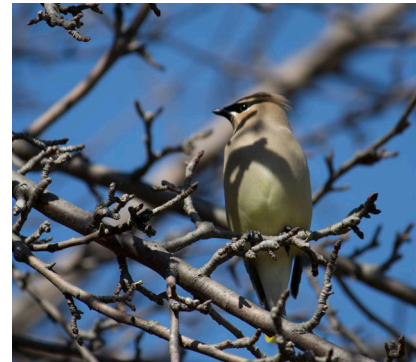
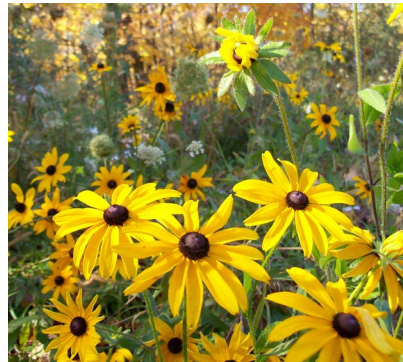
Wagler, Jason. Resource Planner – North. Grand River Conservation Authority. Email correspondence.

Thompson, Melinda. Management Biologist. Ministry of Natural Resources and Forestry, Guelph District. Email Correspondence.

APPENDIX 1
TERMS OF REFERENCE AND COMMENTS

Guelph Pedestrian Bridges - Norwich Street Bridge
City of Guelph

Terms of Reference - Scoped Environmental Impact Study



June 12, 2016

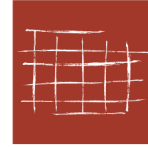
Submitted by:

ABOUD & ASSOCIATES INC.
Consulting Arborists • Ecologists • Landscape Designers



in consultation with:





591 Woolwich Street
Guelph . Ontario
N1H 3Y5

T: 519.822.6839
F: 519.822.4052
info@aboudtng.com
www.aboudtng.com

URBAN FORESTRY
ARBORIST REPORTS
MANAGEMENT PLANS
TREE PRESERVATION PLANS
TREE RISK ASSESSMENT
GIS TREE INVENTORIES
TREE APPRAISALS
MONITORING

ECOLOGICAL RESTORATION
NATURAL SYSTEMS DESIGN
HABITAT RESTORATION
EDGE MANAGEMENT PLANS
RAVINE STEWARDSHIP PLANS
NATURALIZATION PLANS
INTERPRETIVE DESIGN
MONITORING
CONTRACT ADMINISTRATION

ENVIRONMENTAL STUDIES
SUBWATERSHED STUDIES
ENVIRONMENTAL IMPACT
STATEMENTS
ECOLOGICAL LAND
CLASSIFICATION
WETLAND EVALUATION
VEGETATION ASSESSMENT
BOTANICAL INVENTORIES
WILDLIFE SURVEYS
MONITORING

LANDSCAPE ARCHITECTURE
MASTER PLANNING
RESIDENTIAL COMMUNITIES
COMMERCIAL/INDUSTRIAL
HEALTHCARE AND EDUCATION
STREETSCAPES
PARKS AND OPEN SPACES
TRAIL SYSTEMS
GREEN ROOFS
CONTRACT ADMINISTRATION

EXPERT OPINION
OMB TESTIMONY
LEGAL PROCEEDINGS
PEER REVIEW
RESEARCH
EDUCATION

June 12, 2016

Our Project No.: AA16-047A

Adèle Labbé
Environmental Planner-Development
City of Guelph
1 Carden Street, Guelph, Ontario N1H 3A1

**Re: Guelph Pedestrian Bridges - Norwich Street Bridge,
City of Guelph
Terms of Reference - Scoped Environmental Impact Study**

Dear Adèle Labbé:

This document outlines the Terms of Reference (ToR) of the Scoped Environmental Impact Study (EIS), and Tree Protection Plan for a proposed pedestrian bridge crossing the Speed River. The bridge will cross the river on Norwich Street, at an existing bridge location. Please review the revised terms and circulate to City staff for discussion and approval.

BACKGROUND

The Norwich Street Bridge crosses the Speed River on Norwich Street East between Arthur Street North and Cardigan Street. The bridge was constructed in 1882 by the Hamilton Bridge Company and is designated under part IV of the Ontario Heritage Act. The existing bridge requires structural upgrading in order to function as a safe pedestrian crossing.

The proposed pedestrian bridge is within the Grand River Conservation Authority regulation limit, within the floodway and is located within or adjacent to Natural Heritage System features as defined under the schedules of the City of Guelph OP, including Significant Valleylands, Significant Wildlife Habitat, Significant Woodlands, and Cool Water Fish Habitat.

In Preparing the Terms of Reference, the following sources were reviewed for background information:

- Terms of reference for consulting services for the Norwich Bridge, Emma Street to Earl Street Pedestrian Bridge and Wellington/MacDonnell Street to Arthur Street Pedestrian Bridge Municipal Class Environmental Assessments (City of Guelph, 2016),
- Aerial photography of the subject site,
- City of Guelph Official Plan (2014) and Schedules,
- Wellington County GIS mapping (Explore Wellington, accessed June 2, 2016) of natural heritage features (e.g. wooded areas, MNR wetlands, watercourses)
- GRCA mapping (accessed June 2, 2016) of natural heritage features (e.g. regulation limit, GRCA and OMNRF wetlands, ANSI's, and MNR Woodlands),
- Natural Heritage Information Center, Make-a-map, accessed June 2, 2016,
- Ontario Nature. Ontario Reptile and Amphibian Atlas: a citizen science project to map the distribution of Ontario's reptiles and amphibians. Accessed June 2, 2016.
- Ontario Mammal Atlas. Dobbyn, 1995.
- Ontario Breeding Bird Atlas. Bird Studies Canada, 2007.
- Land Information Ontario, Woodland and Wetland Mapping, 2007.
- The City of Guelph's Natural Heritage Strategy and mapping, 2009.
- GRCA hydraulic (HEC RAS) modeling of the Speed River (received June 3, 2016).

STUDY AREA

The study area includes all lands occurring 30m to each side of the proposed pedestrian bridge and where access is permitted (*Figure 1*).

PLANNING CONTEXT

City of Guelph Official Plan

The City of Guelph OP indicates that development is generally prohibited within the *Natural Heritage System*, including minimum or established buffers, with exceptions listed under section 6A.1.2- General permitted uses, these exceptions include; legally existing uses, buildings or structures and essential transportation infrastructure. An EIS or EA may be required where there may be the potential for negative impacts to the natural heritage system.

The above uses may be further limited upon through the specific policies of sections 6A.2 and 6A.3.

Under section 6A.2.5 of the OP, where development within *surface water features* and *fish habitat*, or their established buffers is to occur, they may only be permitted where it has been demonstrated through an EIS, EA or subwatershed plan, to the satisfaction of the City, in consultation with the MNR and/or the GRCA, and/or the Department of Fisheries and Oceans (DFO), that:

- i) there will be no negative impacts on the water resources, fish habitat or related ecological and hydrologic functions;
- ii) there will be no net loss of fish habitat, and no harmful alteration, disruption, or destruction of fish habitat;
- iii) where authorization for the harmful alteration, disruption, or destruction of fish habitat has been obtained from DFO under the Fisheries Act using the guiding principle of no net loss of productive capacity, and the impact of development on fish habitat will be avoided or fully mitigated; and if not, Consolidation loss of fish habitat will be adequately compensated for through a compensation plan approved by the GRCA and/or the DFO; and
- iv) all applicable protocols or policies of the provincial and federal government have been met.

Under Section 6A.2.6 of the OP, Development and site alteration shall not be permitted within *Significant Woodlands* and established buffers, significant woodlands require a minimum 10m buffer, except where existing development precludes it.

Under section 6A.2.9 of the OP, Development and site alteration may be permitted on adjacent lands to *Significant Wildlife Habitat* where it has been demonstrated through an EIS or EA to the satisfaction of the City, and GRCA where applicable, that there will be no negative impacts to Significant Wildlife Habitat or its ecological functions.

Under section 6A.2.7 of the OP, Where *Significant Valleylands* are disturbed, the City promotes restoration and/or naturalization in order to improve water quality and quantity, ensure bank and slope stabilization, and to enhance wildlife habitat.

Under section 6.A 5.1.2 Where the City is undertaking infrastructure work; healthy non-invasive trees within the *urban forest* will be retained to the fullest extent possible. Where trees are required to be removed, relocation or replacement plantings will be provided by the City. Where these trees cannot be retained, they will be subject to the Vegetation Compensation Plan addressed in Policy 6A.5.4. 2. Where regulated trees are damaged or destroyed a Tree Preservation and Vegetation Compensation Plan is needed.

Grand River Conservation Authority

The proposed bridge development is entirely within the Floodplain and the allowances adjacent to these features.

Any alteration to the channel of a river, creek, stream or watercourse requires permission from the GRCA. This includes activities such as, but not limited to, culvert placement or replacement, bridge construction, bed level crossings, piping of watercourses, installation or maintenance of pipeline crossings, cable crossings, construction or maintenance of by-pass, connected or online ponds, straightening and diversions as well as any work on the bed or the banks of the watercourse such as bank protection projects.

The Provincial Policy Statement and the City of Guelph Official Plan indicate that natural heritage features shall be protected for the long term. The Official Plan indicates that legally

existing uses, buildings or structures and essential transportation infrastructure may be permitted within the Natural Heritage System where an EIS or EA demonstrates that there will be no negative impacts on the natural heritage resource.

Consequently, an EIS or EA should be prepared to demonstrate that the proposed development will not negatively impact the *Valleylands*, *Significant Wildlife Habitat*, *Cool Water Fish Habitat* or *Significant Woodland* or the one zone flood plain area.

A Tree Inventory and Preservation Plan and a Vegetation Compensation Plan will be prepared under separate cover to meet the conditions of the City of Guelph Tree By-Law number (2010) - 19058.

BACKGROUND REVIEW

Additional background natural heritage information related to the subject lands and adjacent lands identified the following information:

1. The Ontario Reptile and Amphibian Atlas shows within a 10 km square of the subject lands, the recent and historical presence of 28 species of reptiles and amphibians, including six species of Conservation Concern (Blanding's Turtle (THR), Eastern Ribbonsnake (SC), Milksnake (SC), northern Map turtle (SC), Western Chorus Frog (THR-Federal) and Snapping Turtle (SC)).
2. The Natural heritage Information Center indicates the presence of 3 species of Conservation Concern within the two, 1 km squares covering the project locations (Eastern Ribbon Snake (SC), Milksnake (SC), Northern map turtle (SC), Rusty-patched Bumblebee (END)).
3. The Ontario Mammal Atlas indicates that two species of Conservation Concern, Little Brown Myotis (END) and Northern Myotis (END) may occur within 10km of the study areas.

Based on a review of the background information and an ortho-photograph review of habitat present in the study area, it is unlikely that any Species at Risk identified in the literature review will occur within the proposed pedestrian bridges or adjacent the study areas. As a result, detailed wildlife surveys are not recommended for reptiles or bats, unless candidate habitat is identified in the study area through a review of Significant Wildlife Habitat for the sites.

PROPOSED TERMS OF REFERENCE

Environmental Assessment

To fulfill the requirements of this study, we will:

1. Review background information, (e.g. proposed activity, preliminary studies of tree inventory, relevant sections of Natural heritage system components of the City of Guelph OP, Investigation of Wildlife Atlases and NHIC)
2. Coordinate with River System Advisory Committee (RSAC) and attend one meeting to present and gain approval of the Terms of Reference.
3. Delineate, map and characterize the entire study area using the ELC system. The details to capture are confirmation of boundaries and dominant vegetation of each vegetation community to at least the Ecosite level.
4. Conduct one site visit in summer to complete a 1-season botanical inventory (summer botanical inventories will capture the majority of the flora in the cultural woodland community). Compare identified plant species to provincial and federal SAR lists (COSARO, SARA) provincial ranks (NHIC 2015), global ranks, and Significant Plants of Wellington County (Dogan & Associates 2009)
5. Conduct a screening of all background information and the site to determine the potential for the presence of Species at Risk (SAR).
6. Complete an MNRF Request for Information and determine if any Species at Risk have been identified in the study area, and any studies required by the MNRF under the ESA (2007).
7. Investigate the study area for habitat that may support important life stages for Species at Risk identified during SAR site screening.
8. Investigate the study area for the presence of trees of Butternut.
9. Investigate the study area for the presence of significant wildlife habitat; and complete a site assessment for all potential SWH (e.g. bat maternity habitat, Colonial Nesting Bird Habitat, Waterfowl Overwintering Area, Raptor Wintering Areas, Amphibian Breeding Habitat, Turtle nesting, habitat for species of conservation concern.) using the SWH Criteria schedules for Ecoregion 6E (2015).
10. Complete a review of background fisheries information from the GRCA and MNRF, if available.
11. Complete a DFO Self-Assessment and Request for Review to assess impacts to the cool water fishery identified in this reach of the Speed River.
12. Describe the ecological linkages and functions provided by the river valley.
13. Provide recommendations of mitigation and avoidance measures.
14. Communications with project team and the City as needed.
15. Analyze findings and prepare a map that shows:
 - a) Identified natural heritage features, and functions (e.g. wildlife trail), and landscape level features (e.g. linkages, forest interior habitat);
 - b) The proposed pedestrian bridges;

- c) ELC vegetation communities;
 - d) Other noteworthy features as needed;
 - e) Locations of other natural heritage features from background literature searches (e.g. mammal atlas, herpetofaunal atlas, County's OP, Township Zoning Bylaw.
16. Conduct an impact assessment by reviewing the proposed upgrades to the pedestrian bridge, including direct, in-direct, and induced (i.e. residual, ongoing) impacts on the natural features identified on site (including, but not limited to: natural hazards, significant woodlands, Cool water fishery), and buffers where feasible.
 17. Provide policy rationale for expected impacts to natural heritage features (e.g. removal of trees and grading to accommodate staging and upgrades)
 18. Edge Management Guidelines and Compensation: Provide general recommendations of where and why naturalization treatments may be needed to protect vegetation features (e.g. woodlands, and valleylands) adjacent to the existing pedestrian bridge. Provide rationale and recommendations for tree compensation (e.g. where, why and how much), provide recommendations for the removal of invasive species, and enhancement of riparian habitat along the Speed River.
 19. Complete a Tree Inventory and Preservation Plan, following City of Guelph recommendations, for the bridge, to be provided under separate cover.
 20. Prepare a report of the EIS that includes background information, methods, existing conditions, existing bridge and upgrades, impact assessment and mitigation measures, proposed monitoring programs and enhancement opportunities and appendices of field studies (e.g. flora and ELC data sheets).
 21. Submit report to City, GRCA and RSAC.
 22. Prepare for and attend a RSAC meeting to present report and findings.

Tree Preservation Plan

The Tree Preservation Plan will be prepared by a Certified Arborist in good standing with the International Society of Arboriculture.

1. Tag, inventory and assess all trees (public and private) having a DBH of 10cm and greater within the assessment area (15 m to each side of the proposed pedestrian bridges);
2. Data collected are:
 - tree identification number which corresponds to plans
 - common and scientific name
 - DBH
 - crown diameter (est.)
 - height (est.)
 - tree condition (biological health, structural condition, and overall condition)
 - proposed action (retain, relocate or remove)
 - reason for removal
3. Identify trees of Butternut, an endangered Species at Risk (SAR) in Ontario, within 25m of the proposed activity.

4. Photograph quality trees or groups of trees.
5. Prepare a Tree Preservation Plan (TPP) drawing that will determine trees to be preserved or removed based on:
 - a) Their current condition; and
 - b) The impact from the proposed trail development. Individual trees and tree groups will be assessed and plotted including crown reserves onto a TPP. This investigation will identify trees recommended for preservation and removal based on their suitability within the context of the proposed development using the criteria of condition, and the anticipated impacts from the development.

A drawing of the tree preservation plan will be prepared; of a scale and size (e.g., 24 x 36) as needed that graphically displays the information. It will display crown reserves and tree identification numbers, trees to be preserved and removed, and where tree protection measures (e.g., tree protection fence) are required.

6. Determine compensation requirements for tree removals at the ratios required by the City of Guelph (currently at 3 trees for each tree removed).

Please contact the undersigned should you require additional information of the above.

Yours truly,

ABOUD & ASSOCIATES INC.



Cheryl-Anne Ross, B. Sc.,
Ecology Lead & Wildlife Ecologist

S:\A+A Projects\2016\16-047A Guelph Pedestrian Bridges\Approvals, Comments\Terms of Reference\16-047A Norwich -Terms of Reference Final.docx



LEGEND

- ★

 PROPOSED PEDESTRIAN BRIDGE*
- 120M ADJACENT LANDS
- 30M STUDY AREA
- WOODLANDS
- REGULATORY FLOODPLAIN
- FLOODWAY
- SPECIAL POLICY AREA
- TWO ZONE FRINGE

Information Sources:
1.Orthophotography FBS WMTS service, 2010
2.Regulatory Floodplain GRCA, 2015
3.Woodland, Land Information Ontario, 2008

Title:
**Existing Conditions
& Study Area**

Project:
Guelph Pedestrian Bridges

Date: June. 2016

Project: AA16 - 047A

Scale: 1 : 3000

ABOUT & ASSOCIATES INC.
Consulting Arborists • Ecologists • Landscape Designers
591 Woolwich Street • Guelph • Ontario • Canada • N1H 3Y5
T:519.822.6839 • F:519.822.4052 • info@aboudtng.com • www.aboudtng.com

* Provided for Site Context only, exact location of crossings to be determined through EA

From: April Nix
Sent: August 4, 2016 10:08 AM
To: Tiffany Brule; Andrew Janes
Cc: Adele Labbe
Subject: RE: RSAC comments for Pedestrian Bridges

So here is what I had received back from RSAC – I've kept it separated for each project. The "list" of things is from the suggested motions Adele has prepared and there were a couple of small edits and a couple of questions (included below) but otherwise the committee seemed to be in agreement on the items as listed for each of the studies.

Cheers,

April

Norwich Street Bridge Improvements

THAT the EIS include:

- confirmation of candidate Significant Wildlife Habitat through field study, where appropriate;
- policy context and analysis sections;
- delineation of Significant Woodlands;
- an analysis of cumulative impacts;
- a recommended ranking of alternatives; and

THAT the City return to RSAC with the DRAFT Project File (and attached EIS) to receive advice from RSAC on the preferred alternative.



September 14, 2016

Ryan Hamelin
Aboud & Associates Inc.
591 Woolwich Street
Guelph, ON N1H 3Y5

Dear Mr. Hamelin,

**Re: Terms of Reference for a Scoped Environmental Impact Study
Guelph Pedestrian Bridges- Norwich Street Bridge,
City of Guelph**

We have now had the opportunity to review the Terms of Reference for a Scoped Environmental Impact Study (EIS) dated June 12, 2016 and we offer the following comments.

1. The information provided references the floodplain but does not address potential impacts on flow or hydraulic capacity. This should be addressed concurrently with the EIS or as an independent impact study.
2. The GRCA requests to be circulated on the concept plans of the bridge structure to allow for technical comment.

Advisory Comments

3. It is recommended that a bird survey is completed to identify if birds are using the existing bridge structure for nesting. The Migratory Birds Convention Act prohibits the disturbance of nesting birds, therefore, the inclusion of a bird survey would identify if the structure is used by birds and options to deter birds from nesting prior to construction activities.
4. We recommend that the 1-season botanical inventory is expanded to include a spring inventory in addition to the summer inventory.
5. The study area for the EIS is identified as all lands occurring 30 meters on each side of the proposed pedestrian bridge and where access is permitted; however, the Tree Preservation Plan only encompasses 15 metres study area on each side of the proposed bridge. It is recommended that the area for tree assessment is consistent with the defined study area of 30 metres on each side of the proposed pedestrian bridge as the final bridge works have not been determined, nor the staging area for construction identified.

Should you have any questions or require additional information, please contact Ashley Rye at 519-621-2763 ext. 2320.

Yours truly,

A handwritten signature in black ink, appearing to read 'Fred Natolochny', written over the printed name.

Fred Natolochny, MCIP, RPP
Supervisor of Resource Planning
FN/ar

c.c. Adele Labbe, Environmental Planner, City of Guelph, City Hall, 1 Carden Street., Guelph, ON N1H 3A1

APPENDIX 2
MNRF REQUEST FOR INFORMATION



591 Woolwich Street
Guelph, Ontario
N1H 3Y5

T: 519.822.6839

F: 519.822.4052

info@aboudtng.com

www.aboudtng.com

URBAN FORESTRY
ARBORIST REPORTS
MANAGEMENT PLANS
TREE PRESERVATION PLANS
TREE RISK ASSESSMENT
GIS TREE INVENTORIES
TREE APPRAISALS
MONITORING

ECOLOGICAL RESTORATION
NATURAL SYSTEMS DESIGN
HABITAT RESTORATION
EDGE MANAGEMENT PLANS
RAVINE STEWARDSHIP PLANS
NATURALIZATION PLANS
INTERPRETIVE DESIGN
MONITORING
CONTRACT ADMINISTRATION

ENVIRONMENTAL STUDIES
SUBWATERSHED STUDIES
ENVIRONMENTAL IMPACT
STATEMENTS
ECOLOGICAL LAND
CLASSIFICATION
WETLAND EVALUATION
VEGETATION ASSESSMENT
BOTANICAL INVENTORIES
WILDLIFE SURVEYS
MONITORING

LANDSCAPE ARCHITECTURE
MASTER PLANNING
RESIDENTIAL COMMUNITIES
COMMERCIAL/INDUSTRIAL
HEALTHCARE AND EDUCATION
STREETSCAPES
PARKS AND OPEN SPACES
TRAIL SYSTEMS
GREEN ROOFS
CONTRACT ADMINISTRATION

EXPERT OPINION
OMB TESTIMONY
LEGAL PROCEEDINGS
PEER REVIEW
RESEARCH
EDUCATION

21/06/2016

ESA Guelph
Ministry of Natural Resources and Forestry
Guelph District
1st Floor, 1 Stone Rd W
Guelph ON N1G 4Y2

Our Project #:AA16-047A
Sent by email: esa.guelph@ontario.ca

**Re: Guelph Pedestrian Bridge - Norwich Street Bridge, City of Guelph
Request for Species at Risk and Local Site Information**

To whom it may concern

Please accept this request for Information regarding possible site constraints or information that may affect the site described in the attached Information request, this information will apply to a proposed development (*Figure 1*). The information provided will be used to inform the Terms of Reference and field program, which will be prepared in consultation with the GRCA, and the City of Guelph.

Project Description

A pedestrian Bridge is proposed in the city of Guelph. The first bridge will cross the river on Norwich Street, at an existing bridge location.

Background Information

A thorough background search has been completed; using available resources provided online related to the subject lands and adjacent lands and is listed below:

1. The Ontario Reptile and Amphibian Atlas shows within a 10 km square of the subject lands, the recent and historical presence of 28 species of reptiles and amphibians, including six species of Conservation Concern (Blanding's Turtle (THR), Eastern Ribbonsnake (SC), Milksnake (SC), northern Map turtle (SC), Western Chorus Frog (THR-Federal) and Snapping Turtle (SC)).
2. The Natural heritage Information Center indicates the presence of 4 species of Conservation Concern within the two, 1 km squares covering the project locations (Eastern Ribbon Snake (SC), Milksnake (SC), Northern map turtle (SC), Rusty-patched Bumblebee (END)).
3. The Ontario Mammal Atlas indicates that two species of Conservation Concern, Little Brown Myotis (END) and Northern Myotis (END) may occur within 10km of the study areas.

4. A review of the GRCA web mapping indicates that the bridges are within the GRCA regulation limit.
5. A review of the Land Information Ontario mapping (2007) indicates no wetlands are present in the study area.

Please contact the undersigned should you require additional information of the above.

Yours truly,

ABOUD & ASSOCIATES INC.



Cheryl-Anne Ross, B. Sc. Ecology Lead & Wildlife Ecologist
ISA Certified Arborist ON-2017A
519-822-6839 ext. 7

CC: Jack Turner, GM Blueplan
Tiffany Brule, City of Guelph
Andrew Janes, City of Guelph

Attachments: Figure 1, ESA Guelph MNR Information form

**Guelph District MNRF
Information Request Form**



Consultant Name:	<input type="text"/>				
Company Name:	<input type="text"/>				
Email Address:	<input type="text"/>				
Phone Number:	<input type="text"/>				
Proponent Name:	<input type="text"/>				
Project Name:	<input type="text"/>				
Property Address:	<input type="text"/>				
Township/Municipality:	<input type="text"/>				
Lot & Concession:	<input type="text"/>				
UTM Coordinates: (NAD83)	<table border="0"><tr><td><input type="text"/></td><td><input type="text"/></td></tr><tr><td>Easting (X)</td><td>Northing (Y)</td></tr></table>	<input type="text"/>	<input type="text"/>	Easting (X)	Northing (Y)
<input type="text"/>	<input type="text"/>				
Easting (X)	Northing (Y)				
Brief Description of Undertaking:	<input type="text"/>				

Have you previously contacted someone at MNRF for information on this site? Yes ☐ No ☐

If yes, when and who?

Provide a map of accurate scale to illustrate footprint/study area of the proposed activity in relation to the surrounding landscape (e.g. property boundaries, roads, waterbodies, natural features, towns, and other human landmarks). Use of aerial photography is strongly encouraged. Include scale, north arrow and legend.

ATTACHMENTS – I have attached a: ☐ Picture ☐ Map ☐ Other

REQUEST - I would like to request the following information for the property identified above:

**Requires an appointment and remittance of fees.*

☐ Wetland evaluation and data record *
(please provide name of wetland if known)

☐ ANSI Checksheet *
(please provide name of ANSI if known)

☐ Fish Dot Information *
(fish and other aquatic species found in a particular area of a watercourse)

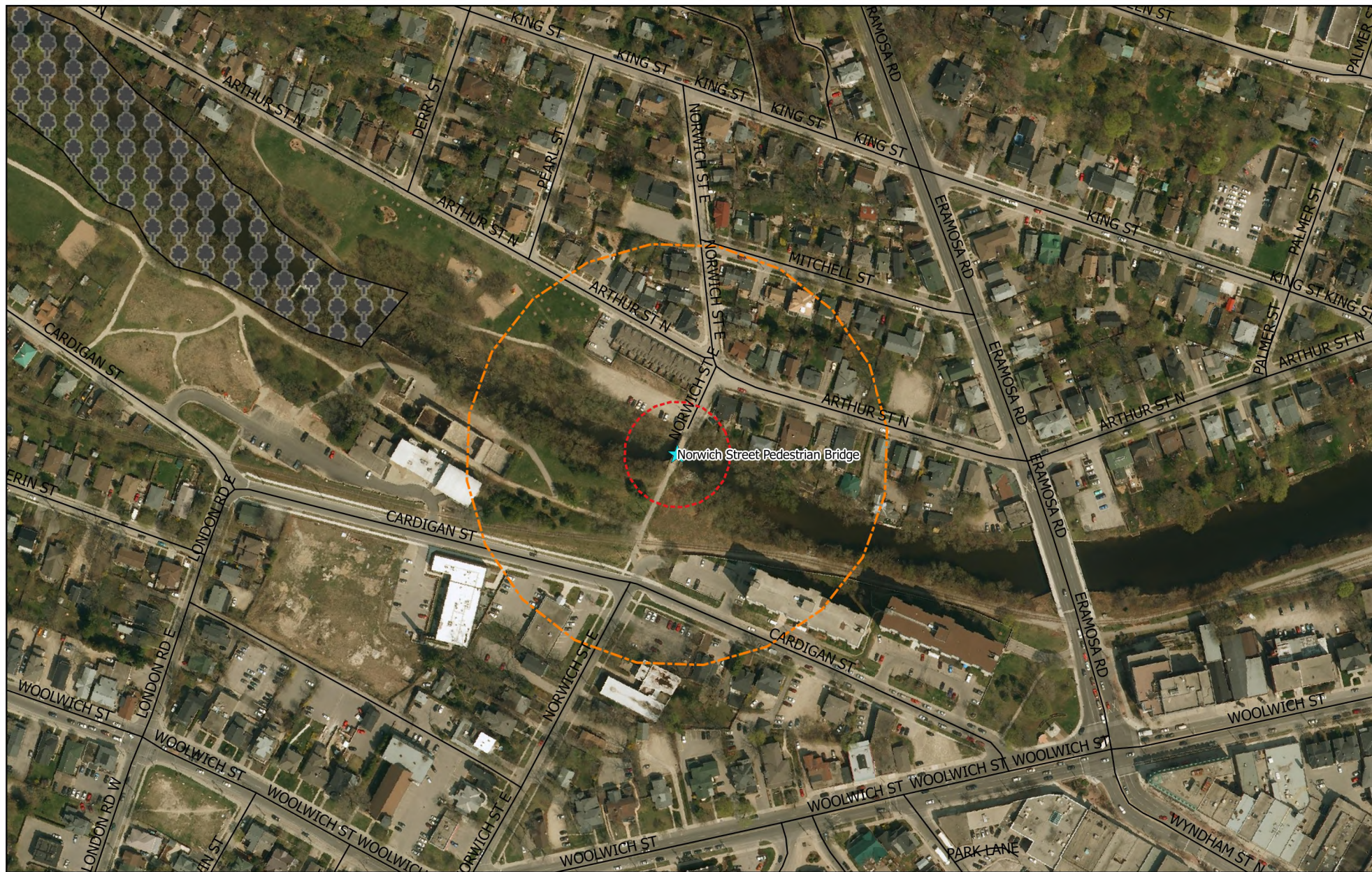
☐ Provincially Tracked Species/Species at Risk

☐ Other





Please forward the completed form to: esa.guelph@ontario.ca

Or send by mail:

*Guelph District, Ministry of Natural Resources and Forestry
1 Stone Road West Guelph, ON N1G 4Y2*



LEGEND

-  PROPOSED PEDESTRIAN BRIDGE*
-  120M ADJACENT LANDS
-  30M STUDY AREA
-  WOODLANDS

Information Sources:

1. Orthophotography FBS WMTS service, 2010
2. Regulatory Floodplain GRCA, 2015
3. Woodland, Land Information Ontario, 2008

Title:

Existing Conditions
& Study Area

Project:

Guelph Pedestrian Bridges

Date: June, 2016

Project: AA16 - 047A

Scale: 1 : 3000



ABOUD & ASSOCIATES INC.
Consulting Arborists • Ecologists • Landscape Designers

591 Woolwich Street, Guelph, Ontario, Canada N1H 3Y5
T: 519.822.6839 • F: 519.822.4052 • info@abouding.com • www.abouding.com

Figure No:

1

July 7, 2016

Cheryl-Anne Ross B.Sc.
Wildlife Ecologist . Ecology Lead
ABOUD & ASSOCIATES INC.
591 Woolwich Street
Guelph . Ontario . N1H 3Y5
T:519.822.6839
cheryl@aboudtng.com

Dear Cheryl-Anne,

Thank you for your inquiry regarding the presence of species at risk and natural heritage features for Norwich Street Pedestrian Bridge and Arthur Street Pedestrian Bridges (called Wellington Street Pedestrian Bridges on your map) in the City of Guelph, Ontario.

Digital mapping for some natural heritage features is available from Land Information Ontario (LIO). MNRF recommends contacting LIO to obtain relevant feature mapping. Datasets of potential interest (and the corresponding LIO dataset) include – wetlands ('Wetland Unit' dataset), ANSI ('ANSI dataset'), wooded areas ('Wooded Areas'), wintering areas ('Wintering Areas'), and fish spawning areas ('Spawning Areas').

The Ministry of Natural Resources and Forestry (MNRF) has had an opportunity to review the natural heritage records and information available at the Guelph District Office, for the above noted file. Please see below for the following information and comments to address your questions noted in the email correspondence.

Wetlands

The Ministry notes that no Wetland Complexes are currently identified within or directly adjacent to the identified land.

ANSI

The Ministry notes that no ANSI's are currently identified within or directly adjacent to the identified land.

Species at Risk

The Ministry notes that there are no species at risk (SAR) records for the area.

Please note that because the province has not been surveyed comprehensively for the presence of species at risk (SAR), the absence in the NHIC database of an EO in a particular geographic area does not indicate the absence of the species in that area. Consequently, the presence of an EO is useful to flag the presence of the species in the area, but is not an appropriate tool to determine whether a species is absent, or whether it should be surveyed for or not in a particular area.

Consequently, we provide the following advice with respect to determining the presence of species at risk on a property for which a land-use change or on-the-ground activity is being proposed (note that some of the following may not apply to a given type of proposed activity, or for a given study area):

I. Habitat Inventory

The District recommends undertaking a comprehensive botanical inventory of the entire area that may be subject to direct and indirect impacts from the proposed activity. The vegetation communities and aquatic habitats in the study area should be classified as per the "Ecological Land Classification (ELC) for Southern Ontario" system, to either the "Ecosite" or "Vegetation Type" level. With respect to aquatic habitats in the study area, we recommend you

collect data on the physical characteristics of the waterbodies and inventory the riparian zone vegetation, so that these habitats can be classified as per the Aquatic Ecosites described in the ELC manual.

II. Potential SAR on the property

A list of species at risk that have the potential to occur in the area can be produced by cross-referencing the ecosites described during the habitat inventory with the habitat descriptions of species at risk known to occur in the county or regional municipality within which the area is located. The species-specific COSEWIC status reports (www.cosewic.gc.ca) are a good source of information on species at risk habitat needs and will be helpful in determining the suitability of the property's ecosites for a given species.

Please note that the Species at Risk in Ontario list (SARO) is a living document and is amended periodically as a result of species assessment and re-assessments conducted by the Committee on the Status of Species at Risk in Ontario (COSSARO). The SARO list can be accessed on the webpage <http://www.ontario.ca/environment-and-energy/species-risk-ontario-list>

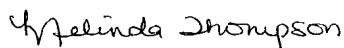
COSSARO also maintains a list of species to be assessed in the future. It is recommended to take COSSARO's list of anticipated assessments into consideration, especially when the proposed start date of the activity is more than 6 months away, or the project will be undertaken over a period greater than 6 months. The list can be viewed by going to <http://www.ontario.ca/page/how-comment-protecting-species-risk>.

III. SAR surveys

The District is of the opinion that each species at risk identified under Step II should be surveyed for, regardless of whether or not the species has been previously recorded in the area, or whether previous records are historical in nature. The survey report should describe how each species at risk was surveyed for, and provide a rationale for why, if any, certain species appearing on the county/ regional municipal list were not the subject of the survey. These rationales must be based on evidence demonstrating either that: suitable habitat for the species is not present on the property or; the project will not have any impacts -including indirect impacts- on the species. Some SAR surveys require an authorization under the *Endangered Species Act 2007* and/or a Scientific Collector's Permit; please contact the Guelph District office if you require further direction regarding these.

Guelph District additionally recommends contacting the municipal planning approval authority and the conservation authority to determine if they have any additional information or records of interest for the study area. Please contact our office if your investigations reveal the presence of species at risk on the subject property. MNRF will be happy to provide further advice regarding the provisions of the *Endangered Species Act* at that time.

Sincerely,



MELINDA J. THOMPSON

MANAGEMENT BIOLOGIST
ONTARIO MINISTRY of NATURAL RESOURCES and FORESTRY
melinda.thompson@ontario.ca

Survey	Time	Date	Staff	Temperature	Wind (Beaufort)	Cloud Cover %	Precipitation	Past Precipitation
ELC	13:30 - 15:45	17/08/2016	RH	28°C	2	30	N	Y
Aquatic Habitat Assessment	13:30 - 15:45	17/08/2016	RH	28°C	2	30	N	Y
Significant Wildlife Habitat Assessment	13:30 - 15:45	17/08/2016	RH	28°C	2	30	N	Y
Species at Risk Habitat Assessment	13:30 - 15:45	17/08/2016	RH	28°C	2	30	N	Y
Tree Inventory	10:00 - 14:30	12/11/2016	SA, RH	22°C	12	20	N	N

APPENDIX 4
ECOLOGICAL LAND CLASSIFICATION DATA SHEETS

,

ELC Community Description & Classification

Polygon: 1

Project No: AA16-047A

Project Name: AA16-074A

Surveyor(s): RH,

Date: August 17, 2016

Polygon Description 1	Community Series: Forest FO	Ecosite: Deciduous Forest FOD	Vegetation Type: Dry – Fresh Manitoba Maple Deciduous Forest Type FODM4_5
System Terrestrial <input type="checkbox"/> Wetland Aquatic	Topographic Feature Lacustrine <input type="checkbox"/> Riverine <input type="checkbox"/> Bottomland Terrace Valley slope Tableland Rolling upland Cliff Talus Crevice Cave Alvar Rockland Beach Bar Sand dune Bluff		Dominant Plant Form Plankton Submerged Floating-lvd. Graminoid Forb Lichen Bryophyte <input type="checkbox"/> Deciduous <input type="checkbox"/> Coniferous Mixed
Cover Open Shrub <input type="checkbox"/> Treed <input type="checkbox"/>	History <input type="checkbox"/> Natural <input type="checkbox"/> Cultural	Community Class Beach-Bar Sand Dune Bluff Barren Tallgrass Prairie Savannah Woodland <input type="checkbox"/> Forest <input type="checkbox"/> Thicket Cultural Swamp Fen Bog Marsh Open Water Shallow Water	
Stand Description:		Soil Analysis:	
Community Age Pioneer Young <input type="checkbox"/> Mid-Aged <input type="checkbox"/> Mature Old Growth		Basal Area (m²/ha)	Soil Drainage Very Rapid Rapid Well <input type="checkbox"/> Moderately Well <input type="checkbox"/> Imperfect Poor Very Poor
Standing Snags Rare <input type="checkbox"/> Occasional <input type="checkbox"/> Abundant Dominant		Soil Moisture Regime Dry Fresh <input type="checkbox"/> Moist <input type="checkbox"/> Wet	
Deadfall Logs Rare <input type="checkbox"/> Occasional <input type="checkbox"/> Abundant Dominant		Effective Soil Texture: Clay Loam Mineral	
Health <input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High	Sensitivity Low <input type="checkbox"/> Medium <input type="checkbox"/> High	Botanical Quality <input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High	Depth to Mottles / Gley Sample: M - cm / G - cm
Slope none <input type="checkbox"/> gentle <input type="checkbox"/> moderate steep (simple or complex)		Depth to Groundwater metres at surface less than 1m <input type="checkbox"/> more than 1 m <input type="checkbox"/>	Depth to Bedrock metres at surface less than 1m <input type="checkbox"/> more than 1 m <input type="checkbox"/>

Vegetation Layer	Height ¹	Cover ²	Dominant Species per Vegetation Layer
1 Canopy	2	4	Acer negundo >> Juglans nigra > Ulmus americana
2 Subcanopy	3	3	Acer negundo > Rhamnus cathartica > Ulmus pumila
3 Understorey	4	2	Rhamnus cathartica >> Wild Red Raspberry = Rubus occidentalis = Solidago canadensis var. canadensis
4 Ground Layer	5	3	Alliaria petiolate = Chelidonium majus > Geranium robertianum > Dactylis glomerata

¹ Height Code: 1=>20m, 2=10m-20m, 3=2m-10m, 4=1m-2m, 5=0.5m-1m, 6=0.2m-0.5m, 7=< 0.2m ² Cover Codes: 0 = none, 1 = 0%- 10%, 2 = 10%- 25%, 3 = 25%-60%, 4= >60%

Size Class Analysis ³	A	A	O-A	R
³ Abundance Code: RS=Rare, O=Occasional, A=Abundant, D=Dominant				

Evidence of Disturbance: Brush pile of residential garden waist
Wildlife / Habitat Observations: Chipmunk
Comments:

				Community Name	Code	% Coverage
Inclusion		Complex	X	Dry Fresh Mixed Meadow Ecosite	MEMM3	10
Inclusion	X	Complex		Parkland	CGL_2	

ELC Community Description & Classification

Project No: AA16-047A

Project Name: AA16-074A

Polygon: 1

Surveyor(s): RH,

Date: August 17, 2016

[illegible][illegible]

ELC Community Description & Classification

Project No: AA16-047A

Project Name: AA16-074A

Surveyor(s): RH,

Polygon: 1

Date: August 17, 2016

Representative Photographs of Vegetation Community:



APPENDIX 5 VASCULAR PLANT LIST
Guelph Pedestrian Bridge - Norwich

Project: AA16-047A
Field Survey Completed: August 17, 2016

SCIENTIFIC_NAME	COMMON_NAME	PLANT TYPE	FAMILY	SRANK	GRANK	NHIC TRACKED	SARO STATUS	COSEWIC STATUS	CC	CW	City of Guelph	Wellington County
Acer negundo	Manitoba Maple	N Tree	Aceraceae	S5	G5	N			0	-2		
Achillea millefolium	Common Yarrow	N Forb	Asteraceae	SNA	G5	N			0	3		
Alliaria petiolata	Garlic Mustard	A Forb	Brassicaceae	SNA	GNR	N			*	0		
Ambrosia psilostachya	Perennial Ragweed	A Forb	Asteraceae	SNA	G5	N			*	1		
Arctium minus	Common Burdock	A Forb	Asteraceae	SNA	GNR	N			*	5		
Bromus inermis	Awnless Brome	A Grass	Poaceae	SNA	G5TNR	N			*	5		
Chelidonium majus	Greater Celadine		Papaveraceae	SNA	GNR	N				5		
Chenopodium album	White Goosefoot	A Forb	Chenopodiaceae	SNA	G5	N			*	1		
Cichorium intybus	Chicory	A Forb	Asteraceae	SNA	GNR	N			*	5		
Cuscuta gronovii	Swamp Dodder	N Forb	Cuscutaceae	S5?	G5T5	N			4	-3		
Dactylis glomerata	Orchard Grass	A Grass	Poaceae	SNA	GNR	N			*	3		
Daucus carota	Wild Carrot	A Forb	Apiaceae	SNA	GNR	N			*	5		
Dipsacus fullonum	Fuller's Teasel		Dipsacaceae	SNA	GNR	N				5		
Eutrochium maculatum var. maculatum	Spotted Joe Pye Weed		Asteraceae	S5	G5T5	N			3	-5		
Geranium robertianum	Herb-Robert	A Forb	Geraniaceae	S5	G5	N			*	5		
Geum aleppicum	Yellow Avens	N Forb	Rosaceae	S5	G5	N			2	-1		
Geum canadense	White Avens	N Forb	Rosaceae	S5	G5	N			3	0		
Helianthus annuus	Common Sunflower	A Forb	Asteraceae	SNA	G5	N			*	1		
Hesperis matronalis	Dame's Rocket	A Forb	Brassicaceae	SNA	G4G5	N			*	5		
Hypericum perforatum	Common St. John's-wort	A Forb	Clusiaceae	SNA	GNR	N			*	5		
Impatiens capensis	Spotted Jewelweed	N Forb	Balsaminaceae	S5	G5	N			4	-3		
Juglans nigra	Black Walnut	N Tree	Juglandaceae	S4	G5	N			5	3		
Lapsana communis	Common Nipplewort	A Forb	Asteraceae	SNA	GNR	N			*	5		
Leonurus cardiaca	Common Motherwort	A Forb	Lamiaceae	SNA	GNR	N			*	5		
Ligustrum vulgare	European Privet	A Shrub	Oleaceae	SNA	GNR	N			*	1		
Parthenocissus inserta	Thicket Creeper	N Vine	Vitaceae	S5	G5	N			3	3		
Persicaria hydropiperoides	False Water-pepper	N Forb	Polygonaceae	S5	G5	N			4	-5		

APPENDIX 5 VASCULAR PLANT LIST
Guelph Pedestrian Bridge - Norwich

Project: AA16-047A
Field Survey Completed: August 17, 2016

<i>Phalaris arundinacea</i>	Reed Canary Grass	N Grass	Poaceae	S5	G5	N			0	-4		
<i>Picea glauca</i>	White Spruce	N Tree	Pinaceae	S5	G5	N			6	3		
<i>Pinus nigra</i>	Black Pine	A Tree	Pinaceae	SNA	GNR	N			*	-5		
<i>Rhamnus cathartica</i>	Common Buckthorn	A Tree	Rhamnaceae	SNA	GNR	N			*	3		
<i>Rubus idaeus</i> ssp. <i>strigosus</i>	Wild Red Raspberry	N Shrub	Rosaceae	S5	G5T5	N			0	-2		
<i>Rubus occidentalis</i>	Black Raspberry	N Shrub	Rosaceae	S5	G5	N			2	5		
<i>Securigera varia</i>	Common Crown-vetch		Fabaceae	SNA	GNR	N				5		
<i>Silphium perfoliatum</i>	Cup Plant	N Forb	Asteraceae	S2	G5	Y			9	-2		
<i>Solidago canadensis</i> var. <i>canadensis</i>	Canada Goldenrod	N Forb	Asteraceae	S5	G5T5	N			1	3		
<i>Symphotrichum lateriflorum</i>	Starved Aster	N Forb	Asteraceae	S5	G5	N			5	5		
<i>Symphotrichum novae-angliae</i>	New England Aster	N Forb	Asteraceae	S5	G5	N			6	0		
<i>Taraxacum officinale</i>	Common Dandelion	A Forb	Asteraceae	SNA	G5	N			*	3		
<i>Ulmus americana</i>	White Elm	N Tree	Ulmaceae	S5	G5?	N			3	-2		
<i>Ulmus pumila</i>	Siberian Elm	A Tree	Ulmaceae	SNA	GNR	N			*	5		
<i>Urtica dioica</i> ssp. <i>gracilis</i>	Slender Stinging Nettle	N Forb	Urticaceae	S5	G5T5	N			2	-1		
<i>Verbena hastata</i>	Blue Vervain	N Forb	Verbenaceae	S5	G5	N			4	-4		

PLANT TYPE	AL = Algae; FE = Fern; FO = Forb; GR = Grass; LC = Lichen; LV = Liverwort; MO = Moss; RU = Rush; SE = Sedge; SH = Shrub; TR = Tree; VI = Herbaceous vine; VW = Woody vine. A= Alien (exotic Specie), N=Native
S_RANK	Provincial rarity rank. Range from S1 to S5; S1 = Extremely rare, S5 = Very common. SNA=plant is not a native component of Ontario flora; NR = Unranked; U = Unrankable; SHY Indicates that the species is of a hybrid origin
G_RANK	Global rarity rank. Range from G1 to G5; G1 = Extremely rare, G5 = Very common. H = Historic; U = Uncertain; X = Extinct; ? = Inexact rank; Q = Taxonomic status questionable; T = Applies to subspecies or variety; Nothing = Rank not yet obtained.
TRACKED	Population and distribution of species Tracked by the Natural Heritage Information Center (NHIC)
SARO STATUS	Status under the Provincial Endangered Species Act, listed on the Species at Risk in Ontario (SARO) list. In order of severity, statuses include: EXP = Extirpated; END = Endangered; THR = Threatened; SC = Special Concern; NL = Not Listed.
COSEWIC STATUS	Status as assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). In order of severity, statuses include: EXP = Extirpated; END = Endangered; THR = Threatened; SC = Special Concern; NS = No Status; NL = Not Listed
CC	Coefficient of Conservatism reflects a species' fidelity to a specific habitat. Range from 0 to 10; 10 = very conservative, not likely in disturbed habitats, 1 = least conservative, likely found in a broad range of habitats.
WC	Coefficient of Wetness reflects a species' affinity for wet soil conditions. Range from -5 to 5; -5 = obligate wetland species, 5 = obligate upland species.
Wellington County	Significant Flora Species within Wellington County as identified by Dougan & Associates, with Snel & Cecile. 2009. Guelph Natural Heritage Strategy. Phase 2, Volume 2 (Significant Plant List for Wellington County). Guelph, Ontario.
City of Guelph	Plant species designated Locally Significant as per the City of Guelph - Locally Significant Species List (2012)

PRESENT	SOURCE	LIST	COMMON NAME	SCIENTIFIC NAME	SARO	COSEWIC	SARA	SCHEDULE	S-Rank	G-Rank	COSEWIC DATE	Area Sensitive species	Area Required	PIF priority Species (BCR 13)	Grand River Conservation Authority (date unk.)	City of Guelph Local significant Species (2012)	Wellington County Significant Wildlife (2008)
		1	INSECTS AT RISK														
X	(NHIC 1998)	4	Rusty-patched Bumble Bee	Bombus affinis	END	END	END	Schedule 1	S1	G1	30/04/2010						
X	OBAO	6	Monarch	Danaus plexippus	SC	SC	SC	Schedule 1	S2N,S4B	G4T3	17/10/2005						
		19	AMPHIBIANS														
X	(ORAA 2016)	21	Blue-spotted Salamander	Ambystoma laterale					S4	G5						✓	✓
X	(ORAA 2016)	22	Spotted Salamander	Ambystoma maculatum					S4	G5						✓	✓
X	(ORAA 1985)	23	Jefferson X Blue-spotted Salamander, Jefferson genome dominates	Ambystoma hybrid pop. 1					S2	G5						✓	✓
X	(ORAA 2016)	29	Eastern Red-backed Salamander	Plethodon cinereus					S5	G5							
X	(ORAA 1978)	30	Mudpuppy	Necturus maculosus	NAR	NAR			S4	G5	17/10/2005					✓	✓
X	(ORAA 2016)	31	Central Newt	Notophthalmus viridescens louisianensis					S4?	G5							
X	(ORAA 2014)	33	American Toad	Anaxyrus americanus					S5	G5							
X	(ORAA 2014)	35	Gray Treefrog	Hyla versicolor					S5	G5							
X	(ORAA 2015)	36	Spring Peeper	Pseudacris crucifer					S5	G5							
X	(ORAA 2012)	39	Western Chorus Frog - Great Lakes / St. Lawrence - Canadian Shield Population	Pseudacris triseriata pop. 2	NAR	THR	THR	Schedule 1	S3	G5TNR	30/04/2008					✓	✓
X	(ORAA 2000)	40	American Bullfrog	Lithobates catesbeianus					S4	G5		✓				✓	✓
X	(ORAA 2014)	41	Green Frog	Lithobates clamitans					S5	G5							
X	(ORAA 2014)	42	Pickereel Frog	Lithobates palustris	NAR	NAR			S4	G5	17/10/2005					✓	✓
X	(ORAA 2012)	43	Northern Leopard Frog	Lithobates pipiens	NAR	NAR			S5	G5	17/10/2005					✓	✓
X	(ORAA 2016)	44	Mink Frog	Lithobates septentrionalis					S5	G5						✓	✓
X	(ORAA 2015)	45	Wood Frog	Lithobates sylvaticus					S5	G5							
		47	SNAKES AND LIZARDS														
X	(ORAA 2016)	56	Milksnake	Lampropeltis triangulum	SC	SC	SC	Schedule 1	S3	G5T5	01/05/2002						✓
X	(ORAA 2008)	58	Northern Watersnake	Nerodia sipedon sipedon	NAR	NAR			S5	G5T5	17/10/2005					✓	✓
X	(ORAA 2014)	60	DeKay's Brownsnake	Storeria dekayi	NAR	NAR			S5	G5T5	17/10/2005					✓	✓
X	(ORAA 2011)	61	Northern Red-bellied Snake	Storeria occipitomaculata occipitomaculata					S5	G5						✓	✓
X	(NHIC 1990), (ORAA 1985)	63	Eastern Ribbonsnake	Thamnophis sauritus	SC	SC	SC	Schedule 1	S3	G5	01/05/2002						✓
X	(ORAA 2016)	64	Eastern Gartersnake	Thamnophis sirtalis sirtalis					S5	G5T5							
X	(ORAA 2016)	66	Smooth Greensnake	Opheodrys vernalis					S4	G5						✓	✓
		70	TURTLES														
X	(ORAA 2015)	72	Snapping Turtle	Chelydra serpentina	SC	SC	SC	Schedule 1	S3	G5T5	30/11/2008						✓
X	(ORAA 2015)	74	Midland Painted Turtle	Chrysemys picta marginata					S5	G5T5							
X	(NHIC 2016)	76	Blanding's Turtle	Emydoidea blandingii	THR	THR	THR	Schedule 1	S3	G4	01/05/2005						✓
X	(ORAA 1925), (NHIC 1924)	78	Northern Map Turtle	Graptemys geographica	SC	SC	SC	Schedule 1	S3	G5	17/10/2005	✓					✓
X	(ORAA 2015)	81	Pond Slider	Trachemys scripta					SNA	SNA							
		83	BIRDS														
X	BBS	86	Pied-billed Grebe	Podilymbus podiceps					S4B,S4N	G5						CP	✓
X	BBS	92	Least Bittern	Ixobrychus exilis	THR	THR	THR	Schedule1	S4B	G5	17/10/2005	✓				CP	✓
X	BBS	93	Great Blue Heron	Ardea herodias					S4	G5						✓	✓
X	BBS	95	Green Heron	Butorides virescens					S4B	G5						CP	✓
X	BBS	98	Trumpeter Swan	Cygnus buccinator	NAR	NAR			S4	G4	17/10/2005					✓	✓
X	BBS	100	Canada Goose	Branta canadensis					S5	G5						CP	
X	BBS	102	Wood Duck	Aix sponsa					S5	G5							✓
X	BBS	105	Mallard	Anas platyrhynchos					S5	G5							
X	BBS	119	Hooded Merganser	Lophodytes cucullatus					S5B,S5N	G5						CP	✓
X	BBS	123	Turkey Vulture	Cathartes aura					S5B	G5						CP	✓
X	BBS	127	Sharp-shinned Hawk	Accipiter striatus	NAR				S5	G5		✓	>30ha		CP	✓	✓
X	BBS	129	Northern Goshawk	Accipiter gentilis	NAR	NAR			S4	G5T5	17/10/2005	✓	>100ha		CP	✓	✓
X	BBS	132	Red-tailed Hawk	Buteo jamaicensis	NAR	NAR			S5	G5	17/10/2005						

X	BBS	139	Ring-necked Pheasant	Phasianus colchicus					SNA	G5							
X	BBS	141	Ruffed Grouse	Bonasa umbellus					S4	G5						CP	
X	BBS	142	Wild Turkey	Meleagris gallopavo					S5	G5							
X	BBS	146	Virginia Rail	Rallus limicola					S5B	G5						CP	
X	BBS	147	Sora	Porzana carolina					S4B	G5						CP	✓
X	BBS	148	Common Moorhen	Gallinula chloropus					S4B	G5						CP	✓
X	BBS	155	Killdeer	Charadrius vociferus					S5B, S5N	G5							
X	BBS	159	Spotted Sandpiper	Actitis macularius					S5	G5						CP	
X	BBS	172	Wilson's Snipe	Gallinago delicata					S5B	G5						CP	
X	BBS	173	American Woodcock	Scolopax minor					S4B	G5						CP	
X	BBS	187	Black Tern	Chlidonias niger	SC	NAR			S3B	G4	17/10/2005	✓	>20ha			CP	✓
X	BBS	188	Rock Pigeon	Columba livia					SNA	G5							
X	BBS	189	Mourning Dove	Zenaidura macroura					S5	G5							
X	BBS	190	Black-billed Cuckoo	Coccyzus erythrophthalmus					S5B	G5						✓	CP
X	BBS	191	Yellow-billed Cuckoo	Coccyzus americanus					S4B	G5							✓
X	BBS	193	Eastern Screech-Owl	Megascops asio	NAR	NAR			S4	G5	17/10/2005						
X	BBS	194	Great Horned Owl	Bubo virginianus					S4	G5							
X	BBS	207	Ruby-throated Hummingbird	Archilochus colubris					S5B	G5						CP	
X	BBS	208	Belted Kingfisher	Megaceryle alcyon					S4B	G5						✓	✓
X	BBS	209	Red-headed Woodpecker	Melanerpes erythrocephalus	SC	THR	THR	Schedule1	S4B	G5	28/04/2007					✓	✓
X	BBS	211	Yellow-bellied Sapsucker	Sphyrapicus varius					S5B	G5		✓	2-5ha			CP	✓
X	BBS	212	Downy Woodpecker	Picoides pubescens					S5	G5							✓
X	BBS	213	Hairy Woodpecker	Picoides villosus					S5	G5		✓	4-8ha				✓
X	BBS	216	Northern Flicker	Colaptes auratus					S4B	G5						✓	✓
X	BBS	217	Pileated Woodpecker	Dryocopus pileatus					S5	G5		✓	>40ha			CP	✓
X	BBS	219	Eastern Wood-pewee	Contopus virens	SC	SC		No Schedule	S4B	G5	27/06/2014					✓	✓
X	BBS	222	Alder Flycatcher	Empidonax alnorum					S5B	G5						CP	
X	BBS	223	Willow Flycatcher	Empidonax traillii					S5B	G5						✓	✓
X	BBS	224	Least Flycatcher	Empidonax minimus					S4B	G5		✓	>100ha			CP	✓
X	BBS	225	Eastern Phoebe	Sayornis phoebe					S5B	G5						CP	
X	BBS	226	Great Crested Flycatcher	Myiarchus crinitus					S4B	G5							
X	BBS	228	Eastern Kingbird	Tyrannus tyrannus					S4B	G5						✓	CP
X	BBS	229	Horned Lark	Eremophila alpestris					S5B	G5						CP	
X	BBS	231	Tree Swallow	Tachycineta bicolor					S4B	G5							
X	BBS	232	Northern Rough-winged Swallow	Stelgidopteryx serripennis					S4B	G5						CP	
X	BBS	233	Bank Swallow	Riparia riparia	THR	THR		No Schedule	S4B	G5	27/06/2014					✓	CP
X	BBS	234	Cliff Swallow	Petrochelidon pyrrhonota					S4B	G5						CP	✓
X	BBS	235	Barn Swallow	Hirundo rustica	THR	THR		No Schedule	S4B	G5	09/05/2011					CP	✓
X	BBS	237	Blue Jay	Cyanocitta cristata					S5	G5							
X	BBS	239	American Crow	Corvus brachyrhynchos					S5B	G5							
X	BBS	241	Black-capped Chickadee	Poecile atricapillus					S5	G5						CP	
X	BBS	244	Red-breasted Nuthatch	Sitta canadensis					S5	G5		✓	>10ha			CP	✓
X	BBS	245	White-breasted Nuthatch	Sitta carolinensis					S5	G5		✓	>10ha				
X	BBS	246	Brown Creeper	Certhia americana					S5B	G5		✓	>30ha			CP	✓
X	BBS	247	Carolina Wren	Thryothorus ludovicianus					S4	G5						CP	✓
X	BBS	249	House Wren	Troglodytes aedon					S5B	G5							
X	BBS	250	Winter Wren	Troglodytes troglodytes					S5B	G5		✓	>30ha				✓
X	BBS	252	Marsh Wren	Cistothorus palustris					S4B	G5						CP	✓
X	BBS	253	Golden-crowned Kinglet	Regulus satrapa					S5B	G5						CP	✓
X	BBS	256	Eastern Bluebird	Sialia sialis	NAR	NAR			S5B	G5	17/10/2005					CP	
X	BBS	257	Veery	Catharus fuscescens					S4B	G5		✓	>10ha			CP	✓
X	BBS	261	Wood Thrush	Hylocichla mustelina	SC	THR		No Schedule	S4B	G5	27/06/2014					✓	
X	BBS	262	American Robin	Turdus migratorius					S5B	G5							
X	BBS	263	Gray Catbird	Dumetella carolinensis					S4B	G5						CP	
X	BBS	265	Brown Thrasher	Toxostoma rufum					S4B	G5						✓	CP
X	BBS	267	Cedar Waxwing	Bombycilla cedrorum					S5B	G5							
X	BBS	269	European Starling	Sturnus vulgaris					SNA	G5							
X	BBS	271	Blue-headed Vireo	Vireo solitarius					S5B	G5		✓	>100ha			CP	✓
X	BBS	273	Warbling Vireo	Vireo gilvus					S5B	G5							
X	BBS	275	Red-eyed Vireo	Vireo olivaceus					S5B	G5							
X	BBS	276	Blue-winged Warbler	Vermivora pinus					S4B	G5						✓	CP
X	BBS	280	Nashville Warbler	Vermivora ruficapilla					S5B	G5						CP	
X	BBS	282	Yellow Warbler	Dendroica petechia					S5B	G5							
X	BBS	283	Chestnut-sided Warbler	Dendroica pensylvanica					S5B	G5						CP	
X	BBS	284	Magnolia Warbler	Dendroica magnolia					S5B	G5		✓	>30ha			CP	✓
X	BBS	288	Black-throated Green Warbler	Dendroica virens					S5B	G5		✓	>30ha				✓
X	BBS	290	Pine Warbler	Dendroica pinus					S5B	G5		✓	15-30ha			CP	✓
X	BBS	298	Black-and-white Warbler	Mniotilta varia					S5B	G5		✓	>100ha			CP	✓
X	BBS	299	American Redstart	Setophaga ruticilla					S5B	G5		✓	>100ha			CP	✓

X	BBS	301	Ovenbird	Seiurus aurocapilla					S4B	G5		✓	>70ha		CP	✓	✓
X	BBS	302	Northern Waterthrush	Seiurus noveboracensis					S5B	G5							
X	BBS	306	Common Yellowthroat	Geothlypis trichas					S5B	G5							
X	BBS	309	Canada Warbler	Wilsonia canadensis	SC	THR	THR	Schedule1	S4B	G5	01/04/2008	✓	>30ha				✓
X	BBS	311	Scarlet Tanager	Piranga olivacea					S4B	G5		✓	>20ha		CP	✓	✓
X	BBS	312	Northern Cardinal	Cardinalis cardinalis					S5	G5							✓
X	BBS	313	Rose-breasted Grosbeak	Pheucticus ludovicianus					S4B	G5				✓		✓	✓
X	BBS	314	Indigo Bunting	Passerina cyanea					S4B	G5							
X	BBS	316	Eastern Towhee	Pipilo erythrophthalmus					S4B	G5					✓	CP	✓
X	BBS	318	Chipping Sparrow	Spizella passerina					S5B	G5							
X	BBS	320	Field Sparrow	Spizella pusilla					S4B	G5				✓	CP	✓	✓
X	BBS	323	Savannah Sparrow	Passerculus sandwichensis					S4B	G5		✓	>50ha	✓	CP	✓	✓
X	BBS	324	Grasshopper Sparrow	Ammodramus savannarum		SC		No Schedule	S4B	G5TU		✓	>10ha	✓	CP	✓	✓
X	BBS	329	Song Sparrow	Melospiza melodia					S5B	G5							
X	BBS	331	Swamp Sparrow	Melospiza georgiana					S5B	G5						CP	
X	BBS	332	White-throated Sparrow	Zonotrichia albicollis					S5B	G5						CP	
X	BBS	338	Bobolink	Dolichonyx oryzivorus	THR	THR		No Schedule	S4B	G5	01/04/2010	✓	>10ha	✓	CP		✓
X	BBS	339	Red-winged Blackbird	Agelaius phoeniceus					S4	G5							
X	BBS	340	Eastern Meadowlark	Sturnella magna	THR	THR		No Schedule	S4B	G5	09/05/2011	✓	>10ha	✓	CP		✓
X	BBS	345	Common Grackle	Quiscalus quiscula					S5B	G5							
X	BBS	346	Brown-headed Cowbird	Molothrus ater					S4B	G5							
X	BBS	348	Baltimore Oriole	Icterus galbula					S4B	G5				✓		✓	✓
X	BBS	350	Purple Finch	Carpodacus purpureus					S4B	G5						CP	
X	BBS	351	House Finch	Carpodacus mexicanus					SNA	G5							
X	BBS	357	American Goldfinch	Carduelis tristis					S5B	G5						CP	
X	BBS	359	House Sparrow	Passer domesticus					SNA	G5							
		361	MAMMALS														
X	OMA(1994)	362	Virginia Opossum	Didelphis virginiana					S4	G5							
X	OMA(1994)	365	Smoky Shrew	Sorex fumeus					S5	G5							
X	OMA(1994)	368	Northern Short-tailed Shrew	Blarina brevicauda					S5	G5							
X	OMA(1994)	371	Star-nosed Mole	Condylura cristata					S5	G5							
X	OMA(1994)	372	Little Brown Myotis	Myotis lucifugus	END	END	END	Schedule 1	S4	G3G4	03/02/2012						
X	OMA(1994)	377	Big Brown Bat	Eptesicus fuscus					S5	G5							
X	OMA(1994)	380	Eastern Cottontail	Sylvilagus floridanus					S5	G5							
X	OMA(1994)	383	European Hare	Lepus europaeus					SNA	G5							
X	OMA(1994)	385	Eastern Chipmunk	Tamias striatus					S5	G5							
X	OMA(1994)	386	Woodchuck	Marmota monax					S5	G5							
X	OMA(1994)	388	Eastern Gray Squirrel	Sciurus carolinensis					S5	G5							
X	OMA(1994)	389	Red Squirrel	Tamiasciurus hudsonicus					S5	G5							
X	OMA(1994)	391	Northern Flying Squirrel	Glaucomys sabrinus					S5	G5		✓				✓	✓
X	OMA(1994)	392	Beaver	Castor canadensis					S5	G5							
X	OMA(1994)	393	Deer Mouse	Peromyscus maniculatus					S5	G5							
	OMA(1994)	394	White-footed Mouse	Peromyscus leucopus					S5	G5							
X	OMA(1994)	397	Meadow Vole	Microtus pennsylvanicus					S5	G5							
X	OMA(1994)	400	Muskrat	Ondatra zibethicus					S5	G5							
X	OMA(1994)	404	Norway Rat	Rattus norvegicus					SNA	G5							
X	OMA(1994)	405	House Mouse	Mus musculus					SNA	G5							
X	OMA(1994)	407	Woodland Jumping Mouse	Napaeozapus insignis					S5	G5						✓	✓
X	OMA(1994)	408	Porcupine	Erethizon dorsatum					S5	G5							
X	OMA(1994)	409	Coyote	Canis latrans					S5	G5							
X	OMA(1994)	413	Red Fox	Vulpes vulpes					S5	G5							
X	OMA(1994)	417	Northern Raccoon	Procyon lotor					S5	G5							
X	OMA(1994)	420	Ermine	Mustela erminea					S5	G5							
X	OMA(1994)	423	American Mink	Mustela vison					S4	G5							
X	OMA(1994)	426	Striped Skunk	Mephitis mephitis					S5	G5							
X	OMA(1994)	430	White-tailed Deer	Odocoileus virginianus					S5	G5							

Guelph Pedestrian Bridges - Norwich

Legend:

COSARO: Committee on Species at Risk Ontario

COSEWIC: Committee on the status of endangered wildlife in Canada

SARA: Species at Risk Act

ESA: Endangered Species Act

END: Endangered

THR: Threatened

SC: special Concern

NAR: Not At Risk

NL: Not listed

DD: Data Deficient

S-Rank:

S1: Critically Imperiled—Critically imperiled in the province (often 5 or fewer occurrences)

S2: Imperiled—Imperiled in the province, very few populations (often 20 or fewer),

S3: Vulnerable—Vulnerable in the province, relatively few populations (often 80 or fewer)

S4: Apparently Secure—Uncommon but not rare

S5: Secure—Common, widespread, and abundant in the province

SX: Presumed extirpated

SH: Possibly Extirpated (Historical)

SNR: Unranked

SU: Unrankable—Currently unrankable due to lack of information

SNA: Not applicable—A conservation status rank is not applicable because the species is not a suitable target for conservation activities

S#S#: Range Rank—A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species

S#B- Breeding status rank

S#N- Non Breeding status rank

?: Indicates uncertainty in the assigned rank

G-Rank:

G1: Extremely rare globally

G1G2: Extremely rare to very rare globally

G2: Very rare globally

G2G3: Very rare to uncommon globally

G3: Rare to uncommon globally

G3G4: Rare to common globally

G4: Common globally

G4G5: Common to very common globally

G5: Very common globally; demonstrably secure

T: Denotes that the rank applies to a subspecies or variety

Hamilton Conservation Area Abundance Codes:

R = Rare. Highly significant to Hamilton area.

U = Uncommon. Moderately significant in Hamilton area.

C = Common. Present in many locations across the City of Hamilton.

M = Migrant. Passes through Hamilton; not known to breed here.

Grand River Conservation Authority:

CP=Conservation Priority

Toronto Region Conservation Authority:

L1- extremely rare locally

L2- very rare locally

L3- rare to uncommon locally

L4-Urban concern

L5-not of concern

Credit Valley Conservation Authority:

<u>TIER</u>	<u>TITLE</u>
1	Species of Conservation Concern
2	Species of Interest
3	Species of Urban Interest
4	Secure Species
5	Non-native& Non-native Hybrid Species

RANKING CRITERIA USED

Federal and provincial legislation, COSEWIC and COSSARO designations, NHIC S1-S3? ranks, local rarity

Local lists, CVC data, professional judgment

Mississauga NAS Ranks, CVC data, professional judgment

CVC data, professional judgment

Not native to Ontario and/or the Credit River watershed but found planted or naturalized

Halton Region Conservation authority:

<u>A</u>	Abundant
<u>C</u>	Common
<u>U</u>	Uncommon
<u>R</u>	Rare
<u>E</u>	Extirpated

Source codes

OBAO: Ontario butterfly Atlas Online

ORAA: Ontario Reptile and Amphibian Atlas

OMA: Ontario Mammal Atlas

OBBA: Ontario Breeding Bird Atlas

References:

- 1.Ontario Partners in Flight (PIF). 2008. Ontario Landbird Conservation Plan: Lower Great Lakes/St. Lawrence Plain (North American Bird Conservation Region 13), Priorities, Objectives and Recommended Actions. Environment Canada (Ontario Region) and Ontario Ministry of Natural Resources. Final Draft, November, 2008.
- 2.COSSARO Status Endangered Species Act, 2007 (Bill 184). Schedules 1- 5. June 30 2008.
- 3.COSEWIC Status COSEWIC. 2014. Canadian Species at Risk. Committee on the Status of Endangered Wildlife in Canada.
- 4.Endangered Species Act, 2007 (Bill 184). Schedules 1- 5. April 21, 2015
5. Credit Valley Conservation, 2010. Credit Valley Conservation Species of Conservation Concern List, Draft.
6. Grand River Conservation Authority, date unk., A checklist of Birds Within the Grand River Watershed
7. Halton Region Conservation Authority, 2006. Halton Natural Areas Inventory.
8. Toronto Region Conservation authority, 2015.Regiona Species of Conservation concern-ranks and scores. Available online: <http://trca.on.ca/the-living-city/monitoring/regional-watershed-monitoring/resources.dot>
9. Hamilton Conservation Authority, 2013. Hamilton Natural Heritage Database
- 10.Dougan & Associates, with Snel & Cecile Environmental Research. 2009. List of Significant Wildlife in Wellington County; In City of Guelph Natural Heritage Strategy - Phase 2: Terrestrial Inventory & Natural Heritage System (VOL. 2 – APPENDICES). Final Report March 2009.

Sources:

- 1.Colin Jones, Ross Layberry, and Alan Macnaughton. Ontario Butterfly Atlas Online. (April 30, 2015). (Available online here: [Toronto Entomologists' Association: http://www.ontarioinsects.org/atlas_online.htm](http://www.ontarioinsects.org/atlas_online.htm))
- 2.Ontario Nature. 2015. Ontario Reptile and Amphibian Atlas: a citizen science project to map the distribution of Ontario's reptiles and amphibians. Ontario Nature, Ontario. (Available online here: <http://www.ontarionature.org/atlas>; Accessed April 29, 2015].
- 3.Dobbyn,J. 1994. Atlas of the Mammals of Ontario. Federation of Ontario Naturalists, Altona Manitoba, Canada. (available online here: <http://www.ontarionature.org/discover/resources/publications.php>)
- 4.Cadman, M.D.,D.A. Sutherland, G.G. Beck, D. Lepage, and A.R. Couturier. 2007. The Atlas of the Breeding Birds Ontario 2001-2005. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto,xxii + 706pp. (Available online here: <http://www.birdsontario.org/atlas/datasummaries.jsp>)
- 5.NHIC,2015. MNR Make a map: Natural Heritage Areas. (Available online: <http://www.ontario.ca/environment-and-energy/make-natural-heritage-area-map>)

APPENDIX 7. CANDIDATE SIGNIFICANT WILDLIFE HABITAT ASSESSMENT
Guelph Pedestrian Bridges – Norwich

Project: AA16-047A

#	SIGNIFICANT WILDLIFE HABITAT (SWH)	CANDIDATE SWH CRITERIA	CRITERIA FOR SWH CONFIRMATION	SWH PROTECTED AREA	SITE ASSESSMENT DETAILS	CANDIDATE SWH	FIELD STUDIES REQUIRED/ COMPLETED	CONFIRMED SWH
SEASONAL CONCENTRATION AREAS OF ANIMALS								
1	Waterfowl stopover and Staging Areas (terrestrial)	- Fields with Sheet water in spring (incl. agricultural)	- Mixed species aggregations of 100 or more individuals confirms SWH	flooded field ecosite and 100-300m radius is the SWH	No Habitat matching Criteria identified in Study Area	No	None required.	No
2	Waterfowl Stopover and Staging (Aquatic)	- Ponds, marshes, lakes, bays, coastal inlets and watercourses and reservoirs - SWTP & SWMP are not SWH	- Aggregations of 100 or more listed species for 7 days (ie. >700 waterfowl use days) confirms SWH	Aquatic ecosite and 100m radius is the SWH	The speed river is of sufficient size and is shallow depth	Yes	Waterfowl overwintering area Identified by MNRF as SWH	Yes
3	Shorebird Migratory stopover	- Shorelines of Lakes, rivers, wetlands, beaches, bars; seasonally flooded, muddy and un-vegetated shoreline habitat	- 3 or more listed species and >1000 shorebird use days, or >100 whimbrel, confirms SWH	Shoreline ecosite and 100m radius is the SWH	No Habitat matching Criteria identified in Study Area, >5km from any Great Lake	No	None required	No
4	Raptor Wintering Area	- Combination of upland field and woodland habitat >20ha total (includes >15ha upland field) - least disturbed sites, idle, fallow or lightly grazed field/meadow best	- 1 or more Short-eared Owl, or, at least 10 individuals and 2 listed species for a minimum of 20 days, and 3 of 5 years, confirms SWH	Ecosite communities (field and woodland) is the SWH	No Habitat matching Criteria identified in Study Area	No	None required	No
5	Bat Hibernacula	- Caves, mine shafts, underground foundations, karsts - buildings are not SWH	- All sites with confirmed hibernating bats, confirms SWH	Ecosite and 200m radius is the SWH	No Habitat matching Criteria identified in Study Area	No	None required	No
6	Bat Maternity Colony	- All forested ecosites, FOD, FOC, FOM, SWD, SWM, SWC with >10/ha trees (>25cm DBH) in early stages of decay (class 1-3) - buildings are not SWH	- >10 Big Brown Bats, >20 Little Brown Myotis, >5 adult female Silver-haired Bats confirms SWH	Entire woodland or forest stand ELC ecosite containing colony is the SWH	Forested ecosites present in Study area with trees >25cm DBH.	Yes	Trees assessed for suitability during Tree Inventory, no trees observed meeting candidate requirements	No
7	Turtle Wintering Area	- Areas with permanent water deep enough not to freeze, with mud/soft substrates	- 5 over-wintering Midland Painted Turtles, 1 or more Northern Map Turtle or Snapping Turtle confirms SWH	Mapped ELC ecosite, or deep pool element where turtles overwinter is the SWH	The Speed River may provide areas of permanent water that do not freeze and muck for overwintering.	Yes	Substrate within river habitat will not be impacted, no surveys recommended.	No

APPENDIX 7. CANDIDATE SIGNIFICANT WILDLIFE HABITAT ASSESSMENT

Project: AA16-047A

Guelph Pedestrian Bridges – Norwich

#	SIGNIFICANT WILDLIFE HABITAT (SWH)	CANDIDATE SWH CRITERIA	CRITERIA FOR SWH CONFIRMATION	SWH PROTECTED AREA	SITE ASSESSMENT DETAILS	CANDIDATE SWH	FIELD STUDIES REQUIRED/ COMPLETED	CONFIRMED SWH
8	Reptile Hibernaculum	- Sites below the frost line; rock barren, crevice and cave, talus, alvar, rock piles, slopes, stone fences and crumbling foundations	- Presence of hibernacula with minimum 5 individuals of 1 snake species/ individuals of 2 or more species confirms SWH - Congregations of a minimum of 5 snakes of 1 species/ individuals of 2 or more snake species, near potential hibernacula on sunny warm days in spring and fall confirms SWH	Feature hibernacula is located in, and 30m radius is the SWH	No rock and rubble piles were identified in study area	No	None required	No
9	Colonially-nesting Bird Habitat (cliff/bank)	- Eroding banks, sandy hills, borrow pits, steep slopes, sand piles, cliff faces, bridge abutments, silos, barns	- 1 or more nest sites with 8 or more Cliff Swallow or, 50 Bank Swallow and Rough-winged Swallow pairs during the breeding season.	Colony and 50m radius around peripheral nest is the SWH	No Habitat matching Criteria identified in Study Area	No	None required	No
10	Colonially-nesting Bird Habitat (Tree/shrub)	- Live or dead standing trees in wetlands, lakes, islands and peninsulas, occasionally shrubby and emergent vegetation	- 5 or more active Great-blue Heron or other listed species nests	Edge of the colony plus minimum 300m radius, or extent of the forest ecosite, or entire island <15ha is the SWH	No Habitat matching Criteria identified in Study Area	No	None required	No
11	Colonially-nesting Bird Habitat (Ground)	- Rocky islands or peninsulas within a lake or large river(natural or artificial)	- >25 active nests of Herring Gull, Ring-billed Gull, >5 active nests of Common Tern, or >2 active nests of Caspian Tern. 5 or more pairs of Brewer's Blackbird. Any active nesting colony of Little Gull, Great Black-backed Gull.	Edge of colony plus min 150m radius or extent of ELC ecosite, or island <3ha is the SWH	No Habitat matching Criteria identified in Study Area	No	None required	No
12	Migratory Butterfly Stopover Area	- At least 10ha, with undisturbed field/meadow and forest or woodland edge habitat present, within 5km of Lake Ontario.	- Presence of Monarch use days >5000 or >3000 where there is a mix of Monarch with Painted Ladies or White Admirals	Field/meadow and forest/woodland is the SWH	No Habitat matching Criteria identified in Study Area, >5km from any Great Lake	No	None required	No
13	Land bird Migratory Stopover Area	- Woodlots >5ha in size - within 5km of lake Ontario	- Use by >200 birds/day, with >35species, with at least 10sp recorded on 5 different survey dates.	Woodlot is the SWH	No Habitat matching Criteria identified in Study Area, >5km from any Great Lake	No	None required	No
14	Deer Yarding Areas	- ELC communities providing Thermal cover (FOM,FOC,SWM,SWC, CUP2, CUP3, FOD3, CUT)	- Deer yards are managed by MNRF, available through district offices and LIO.	LIO mapping	No Deer yarding areas identified on LIO Mapping	No	None required.	No
15	Deer Winter Congregation Areas	- All forested ecosites >100ha - Conifer Plantations <50ha may be used	- Deer management is the responsibility of the MNRF - Contact MNRF or LIO for known deer winter areas.	LIO mapping	No Deer Winter Congregation areas identified on LIO Mapping	No	None required.	No
RARE VEGETATION COMMUNITIES								
16	Cliffs & Talus Slopes	- Cliff: vertical to near vertical bedrock >3m in height - Talus slope: rock rubble at the base of a cliff made up of coarse rocky debris	- Confirm any ELC Vegetation Type for Cliffs or Talus Slopes	Area of ELC sites: TAO, TAS, TAT, CLO, CLS, CLT	No Habitat matching Criteria identified in Study Area	No	None required	No

ABOUD & ASSOCIATES INC.

APPENDIX 7. CANDIDATE SIGNIFICANT WILDLIFE HABITAT ASSESSMENT

Project: AA16-047A

Guelph Pedestrian Bridges – Norwich

#	SIGNIFICANT WILDLIFE HABITAT (SWH)	CANDIDATE SWH CRITERIA	CRITERIA FOR SWH CONFIRMATION	SWH PROTECTED AREA	SITE ASSESSMENT DETAILS	CANDIDATE SWH	FIELD STUDIES REQUIRED/ COMPLETED	CONFIRMED SWH
17	Sand Barren	- Exposed, sparsely vegetated & caused by lack of moisture, fires and erosion.	- area >0.5ha in size - Confirm any ELC vegetation Type for Sand Barren - Not dominated by exotic or introduced species	Area of ELC ecosite is the SWH	No Habitat matching Criteria identified in Study Area	No	None required	No
18	Alvar	- Level, mostly un-fractured calcareous bedrock feature, overlain by a thin veneer or soil	- area >0.5ha in size - Field Studies that identify four of the five Alvar Indicator Species - Not dominated by exotic or introduced species	Area of ELC ecosite is the SWH	No Habitat matching Criteria identified in Study Area	No	None required	No
19	Old Growth Forest	- >30ha forests with at least 10ha interior habitat and multi-layered canopy	- Dominant Tree Species >140 years old - No recognizable signs forestry practices (old stumps)	Area of ELC ecosite is the SWH	No Habitat matching Criteria identified in Study Area	No	None required	No
20	Savannah	- Tall Grass Prairie Habitat with 25%-60% Tree cover - Remnant sites such as Railway Right of ways are not SWH	- No minimum size, and must be restored to a natural state. - Confirm one or more savannah indicator species - Not dominated by exotic or introduced species	Area of ELC ecosite is the SWH	No Habitat matching Criteria identified in Study Area	No	None required	No
21	Tallgrass Prairie	- Ground cover dominated by prairie grasses with <25% tree cover - Remnant sites such as Railway Right of ways are not SWH	- No minimum size, and must be restored to a natural state. - Confirm one or more prairie indicator species - Not dominated by exotic or introduced species	Area of ELC ecosite is the SWH	No Habitat matching Criteria identified in Study Area	No	None required	No
22	Other Rare Vegetation Communities	- All Provincially Rare S1, S2, S3 Vegetation Communities (Appendix M of SWHTG)	- Field Studies Confirming ELC vegetation type is a rare vegetation community	Area of ELC ecosite is the SWH	No Habitat matching Criteria identified in Study Area	No	None required	No
SPECIALIZED HABITAT FOR WILDLIFE								
23	Waterfowl Nesting Areas	- Upland Habitat, adjacent to Wetland ELC ecosites (except SWC, SWM) - Extends 120m from a wetland (>0.5ha) and any small wetlands (<0.5ha) within a cluster of at least 3 - Upland area at least 120m wide	- Presence of 3 or more nesting pairs of listed species excluding Mallards - Presence of 10 or more nesting pairs including mallards - Any active Black Duck nesting site	SWH may be greater than or less than 120m from the wetland edge and must provide enough habitat for waterfowl to successfully nest	No Habitat matching Criteria identified in Study Area	Yes	Breeding bird surveys completed, one mallard with new ducklings observed in woodlot, does not meet criteria	No
24	Bald Eagle or Osprey Nesting, Foraging and Perching Habitat	- Forest communities, adjacent to riparian areas - Osprey nests usually at top of tree - Bald Eagle nest usually in super canopy tree in a notch within canopy	- Studies confirm one or more active Bald Eagle or Osprey nest - Alternate nests included in SWH - Nests must be used annually, if found inactive, must be known inactive at least 3 years, or suspected unused for 5 years if unknown	Active nest plus 300m for Osprey Active nest plus 400-800m for Bald Eagle	Treed area of insufficient size to provide suitable nesting habitat	No	No surveys are recommended	No

APPENDIX 7. CANDIDATE SIGNIFICANT WILDLIFE HABITAT ASSESSMENT

Project: AA16-047A

Guelph Pedestrian Bridges – Norwich

#	SIGNIFICANT WILDLIFE HABITAT (SWH)	CANDIDATE SWH CRITERIA	CRITERIA FOR SWH CONFIRMATION	SWH PROTECTED AREA	SITE ASSESSMENT DETAILS	CANDIDATE SWH	FIELD STUDIES REQUIRED/ COMPLETED	CONFIRMED SWH
25	Woodland Raptor Nesting Habitat	<ul style="list-style-type: none"> - Forested communities, forested swamp communities and cultural Plantations - Natural Forested/conifer plantations >30ha with >10ha interior habitat (200m buffer) 	<ul style="list-style-type: none"> - One or more active nest of listed species 	Nest protection radius: <ul style="list-style-type: none"> - Red-Shouldered Hawk, Northern Goshawk 400m - Barred Owl 200m - Broad-winged Hawk, Coopers Hawk 100m - Sharp-shinned Hawk 50 	No Habitat matching Criteria identified in Study Area	No	None required	No
26	Turtle Nesting Areas	<ul style="list-style-type: none"> - Exposed Mineral soil (sand or gravel) adjacent (<100m) or within shallow marsh, shallow submerged, shallow floating, bog or fen communities - Located in open sunny areas, away from roads and less prone to predation - Municipal and provincial road shoulders are not SWH. 	<ul style="list-style-type: none"> - Confirm 5 or more nesting Midland Painted Turtles, 1 or more nesting Northern Map Turtle or Snapping Turtle 	Area or sites with exposed mineral soils, plus a radius of 30-100m around the nesting area is the SWH.	No Habitat matching Criteria identified in Study Area	No	None required, one common snapping turtle and one painted turtle observed in the study area, no natural suitable nesting sites observed, nesting may occur along existing trail or rail bed	No
27	Seeps and Springs	<ul style="list-style-type: none"> - Areas where ground water comes to the surface - Any forested area within the headwaters of a stream or river system 	<ul style="list-style-type: none"> - Confirm site with 2 or more seeps/springs. 	Area of ELC forest ecosite containing seep/spring is the SWH	Seeps and springs possible within forested and wetland communities	Yes	ELC complete	No seeps or springs identified
28	Amphibian Breeding Habitat (woodland)	<ul style="list-style-type: none"> - Breeding pools within woodlands - Wetland, pond or pool >500m² within or adjacent (<120m) to a woodland. - Woodlands with permanent ponds, or those with water until mid-July more likely to be used. 	<ul style="list-style-type: none"> - Confirm Breeding population of 1 or more listed newt/salamander species, 2 or more of the listed frog species with at least 20 individuals (adults or egg masses), 2 or more of the listed frog species with call code levels of 3. - Wetland adjacent to woodlands includes travel corridor connecting features as SWH. 	Wetland area, plus 230m radius of woodland is the SWH.	No Habitat matching Criteria identified in Study Area	No	None required	No
29	Amphibian Breeding Habitat (Wetland)	<ul style="list-style-type: none"> - Swamp, marsh, fen, bog, open aquatic and shallow aquatic ELC communities. Typically isolated from woodlands (>120m), but includes larger wetlands with primarily aquatic species (bull frogs) that are adjacent to woodlands. - Wetlands >500m² - Presence of shrubs & logs - Bullfrogs require permanent water bodies and abundant emergent vegetation. 	<ul style="list-style-type: none"> - Confirm Breeding populations of 1 or more listed newt/salamander species, or 2 or more listed frog/toad species with at least 20 individuals (adults or egg masses), or 2 or more listed frog/toad species with a call code level of 3 - Or any wetland with confirmed breeding Bullfrog. 	ELC ecosite and shoreline is the SWH Movement corridors (SWH) must be considered if this habitat is significant	No wetlands >120m from woodland habitat	No	None required	No

APPENDIX 7. CANDIDATE SIGNIFICANT WILDLIFE HABITAT ASSESSMENT

Project: AA16-047A

Guelph Pedestrian Bridges – Norwich

#	SIGNIFICANT WILDLIFE HABITAT (SWH)	CANDIDATE SWH CRITERIA	CRITERIA FOR SWH CONFIRMATION	SWH PROTECTED AREA	SITE ASSESSMENT DETAILS	CANDIDATE SWH	FIELD STUDIES REQUIRED/ COMPLETED	CONFIRMED SWH
30	Area-sensitive Breeding Bird Habitat	<ul style="list-style-type: none"> - Habitats where interior breeding birds are breeding - Large mature(>60 years) forest stands or woodlots >30ha - Forest and swamp ELC communities - Interior habitat at least 200m from edge 	<ul style="list-style-type: none"> - Presence of nesting or breeding pairs of 3 or more of the listed species - Any site with Cerulean Warbler or Canada Warbler is SWH 	ELC ecosite is the SWH	No interior habitat identified in study area	no	None required	No
HABITATS OF SPECIES OF CONSERVATION CONCERN CONSIDERED SWH								
31	Marsh Bird Breeding Habitat	<ul style="list-style-type: none"> - Some meadow marsh, shallow submerged, shallow floating, fen and bog communities (see SWH Ecoregion guide for specifics) - Nesting occurs in wetlands, all wetland habitat is considered with presence of shallow water with emergent aquatic vegetation - Green heron at edge of water sheltered by shrubs and trees. 	<ul style="list-style-type: none"> - 5 or more nesting pairs of Sedge Wren or Marsh Wren, 1 pair of Sandhill Crane, or breeding by any combination of 5 or more of the listed species - Any Wetland with 1 or more breeding pair Black Tern, Trumpeter Swan, Green Heron or Yellow Rail 	ELC ecosite is the SWH	No candidate habitat identified in study area.	No	Breeding Bird Surveys complete	No
32	Open Country Bird Breeding Habitat	<ul style="list-style-type: none"> - Grassland area >30ha (natural & cultural fields and meadows) - Grasslands not class 1 or 2 agriculture (no row crops or intensive hay or livestock pasturing) - Mature hayfields or pasture at least 5 years old 	<ul style="list-style-type: none"> - Nesting or breeding of 2 or more of the listed species - Field with 1 or more Short-eared Owls 	Contiguous ELC ecosite is the SWH	No Habitat matching Criteria identified in Study Area	No	None required	No
33	Shrub/Early Successional Bird Breeding Habitat	<ul style="list-style-type: none"> - Cultural thickets, savannah and woodland habitat - Large field area succeeding to shrub and thicket habitat >10ha in size - Patches of shrub ecosite may be complexed into larger old field ecosites for some species 	<ul style="list-style-type: none"> - Confirm nesting or breeding of 1 of the listed indicator species and at least 2 of the common species - Habitat with Yellow-breasted Chat Or Golden-winged Warbler is SWH 	SWH is contiguous ELC ecosite field/thicket area	No Habitat matching Criteria identified in Study Area	No	None required	No

APPENDIX 7. CANDIDATE SIGNIFICANT WILDLIFE HABITAT ASSESSMENT

Project: AA16-047A

Guelph Pedestrian Bridges – Norwich

#	SIGNIFICANT WILDLIFE HABITAT (SWH)	CANDIDATE SWH CRITERIA	CRITERIA FOR SWH CONFIRMATION	SWH PROTECTED AREA	SITE ASSESSMENT DETAILS	CANDIDATE SWH	FIELD STUDIES REQUIRED/ COMPLETED	CONFIRMED SWH
34	Terrestrial Crayfish	<ul style="list-style-type: none"> - Meadow marsh, shallow marsh, swamp thicket, deciduous swamp and mixed swamp communities - Cultural meadow with inclusions of meadow marsh may be used - Wet edges of marshes and wet meadows should be surveyed for crayfish 	<ul style="list-style-type: none"> - Presence of 1 or more individuals of listed species or their chimneys in suitable habitat 	Area of ELC ecosite or Eco element area of meadow marsh or swamp within the larger ecosite area is the SWH	Candidate habitat identified in study area.	Yes	Record all chimneys observed during ELC	No
35	Special Concern & Rare Wildlife Species	<ul style="list-style-type: none"> - All Special concern and Provincially Rare plant and animal species - Where an element occurrence is identified within a 1 or 10km grid for a species listed, linking candidate habitat on the site must be completed to ELC ecosites 	<ul style="list-style-type: none"> - Assessment/inventory of site for identified special concern or rare species completed during time of year when species is present or easily identifiable - Habitat must be easily mapped and cover an important life stage component (specific nesting habitat, foraging) 	SWH is the finest ELC scale that protects the form and function of the habitat	NHIC did not identify any S1-S3 species as occurring in the 1km square containing the study area.	No	Any S1-S3 Species identified during any field surveys will be identified and SWH delimited.	No
ANIMAL MOVEMENT CORRIDORS								
36	Amphibian Movement Corridor	<ul style="list-style-type: none"> - Corridors may occur in all ecosites associated with water - Presence of significant amphibian breeding indicates the requirement for identifying corridors - Movement corridors between breeding habitat and summer habitat 	<ul style="list-style-type: none"> - Corridors typically include areas with native vegetation, with several layers of vegetation, unbroken by roads, waterways or waterbodies are most significant - At least 15 of vegetation on both sides of the waterway or up to 200m wide of woodland habitat with gaps of <20m - Shorter corridors are more significant than longer, but amphibians must be able to get to and from their summer breeding habitat 	Corridor is the SWH	No Habitat matching Criteria identified in Study Area	No	None required	No
37	Deer Movement Corridor	<ul style="list-style-type: none"> - May occur in all forested ecosites - Determined when deer wintering habitat is confirmed as SWH 	<ul style="list-style-type: none"> - Corridors at least 200m wide with gaps <20m leading to wintering habitat - Unbroken by roads and residential areas - Shorter corridors are more significant 	Corridor is the SWH	No Habitat matching Criteria identified in Study Area	No	None required	No

COMMON NAME	SCIENTIFIC NAME	SARO	COSEWIC	S-RANK	BACKGROUND SOURCES	HABITAT REQUIREMENTS	SUITABLE HABITAT IN STUDY AREA	FIELD STUDIES COMPLETED/ REQUIRED	OBSERVED BY A & A	Reference
Amphibians										
Jefferson Salamander	<i>Ambystoma jeffersonianum</i>	END	END	S2	MNRF (Wellington County) ORAA (1985) NHIC (1960)	Adults are found within upland deciduous or mixed forest habitat with suitable breeding ponds, such as kettle ponds, natural basins and limestone sink holes, which can be permanent or ephemeral, and include appropriate egg attachment sites and lack of predatory fish (OCSEWIC 2010).	No Habitat matching Criteria identified in Study Area	The Study Area was investigated for habitat during ELC and Vegetation Surveys. No further studies required.	None Observed.	COSEWIC. 2010. COSEWIC assessment and status report on the Jefferson Salamander <i>Ambystoma jeffersonianum</i> in Canada. Committee on the Status of Endangered Wildlife in Canada . Ottawa. xi + 38 pp.
Western Chorus Frog - Great Lakes / St. Lawrence - Canadian Shield Population	<i>Pseudacris triseriata</i> pop. 2	NAR	THR	S3	(ORAA 2012)	Generally found in lowland communities, such as swamps, inhabiting lowland shrubs and grasses in the community, near breeding habitat. Breeding occurs in lowland, ephemeral ponds, devoid of predatory fish species (COSEWIC 2008a)	No Habitat matching Criteria identified in Study Area	The Study Area was investigated for habitat during ELC and Vegetation Surveys. No further studies required.	None Observed.	COSEWIC. 2008. COSEWIC assessment and update status report on the Western Chorus Frog <i>Pseudacris triseriata</i> Carolinian population and Great Lakes/St. Lawrence – Canadian Shield population in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 47 pp.
Butterflies, Bees, Damselflies and Dragonflies										
Monarch	<i>Danaus plexippus</i>	SC	SC	S2N, S4B	MNRF (Wellington County)	Requires milkweed for larval feeding, other wildflower species are also important for adult feeding when milkweed is not in flower; often found in abandoned farmland, along roadsides, and other open spaces (COSEWIC 2010b)	No Habitat matching Criteria identified in Study Area. Host Plant not identified in the study area	The Study Area was investigated for habitat during ELC and Vegetation Surveys. No further studies required.	None Observed.	COSEWIC. 2010. COSEWIC assessment and status report on the Monarch <i>Danaus plexippus</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 43 pp.
Rusty-patched Bumble Bee	<i>Bombus affinis</i>	END	END	S1	MNRF (Wellington County), (NHIC 1998)	Uses a variety of open or semi-open habitat, including meadows, agricultural land and savannah habitat for foraging. Nests are often found underground, in old rodent burrows (COSEWIC 2010c).	No Habitat matching Criteria identified in Study Area.	The Study Area was investigated for habitat during ELC and Vegetation Surveys. No further studies required.	None Observed.	COSEWIC. 2010. COSEWIC assessment and status report on the Rusty-patched Bumble Bee <i>Bombus affinis</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 34 pp.
West Virginia White	<i>Pieris virginenis</i>	SC	NAR	S3	MNRF (Wellington County)	Found in rich deciduous and mixed forests and swamps with a poorly vegetated shrub layer. The larvae feed only on the leaves of a few host plants, including the Two-leaved Toothwort (<i>Cardamine diphylla</i>) and cut-leaved toothwort (Burke 2013).	No Habitat matching Criteria identified in Study Area. Host Plant not identified in the study area	The Study Area was investigated for habitat during ELC and Vegetation Surveys. No further studies required.	None Observed.	Peter S. Burke. 2013. Management Plan for the West Virginia White (<i>Pieris virginiensis</i>) in Ontario. Ontario Management Plan Series. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. v + 44 pp.
Birds										
Acadian Flycatcher	<i>Empidonax Virens</i>	END	END	S2S3B	MNRF (Wellington County)	Breeds in mature deciduous and mixed forests, using tableland forests and ravine habitats. Nests are often located over vernal pools, trails or bare ground in tablelands or over streams in ravines (COSEWIC 2010d).	No Habitat matching Criteria identified in Study Area.	No Studies Required	None Observed.	COSEWIC. 2010. COSEWIC assessment and status report on the Acadian Flycatcher <i>Empidonax virens</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 38 pp.
Bald Eagle	<i>Haliaeetus leucocephalus</i>	SC	NAR	S2N, S4B	MNRF (Wellington County)	Prefers deciduous and mixed-deciduous mature forest habitat close to water bodies including lakes and rivers; nests in super canopy trees including Pine (Armstrong 2014).	No Habitat matching Criteria identified in Study Area. No super trees for nesting	No Studies Required	None Observed.	Armstrong, Ted (E.R.). 2014. Management Plan for the Bald Eagle (<i>Haliaeetus leucocephalus</i>) in Ontario. Ontario Management Plan Series. Prepared for the Ontario Ministry of Natural Resources and Forestry, Peterborough, Ontario. vii + 53 pp.
Bank Swallow	<i>Riparia riparia</i>	THR	THR	S4B	MNRF (Wellington County), BBS	Breeds in a variety of natural and artificial bank type habitat, such as bluffs, stream and river banks, sand and gravel pits, piles of sand, topsoil and other material. Nests are typically in vertical or near-vertical surfaces (COSEWIC 2013b).	No Habitat matching Criteria identified in Study Area.	No Studies Required	None Observed.	COSEWIC. 2013. COSEWIC assessment and status report on the Bank Swallow <i>Riparia riparia</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 48 pp.
Barn Swallow	<i>Hirundo rustica</i>	THR	THR	S4B	MNRF (Wellington County), BBS	Occurs in farmland, along lake/river shorelines, in wooded clearings and in urban populated areas. Nesting may occur inside or outside buildings; under bridges and in road culverts (COSEWIC 2011a).	No Habitat matching Criteria identified in Study Area.	No Studies Required	None Observed.	COSEWIC. 2011. COSEWIC assessment and status report on the Barn Swallow <i>Hirundo rustica</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 37 pp.
Barn Owl	<i>Tyto alba</i>	END	END	S1	MNRF (Wellington County)	Requires open habitat for foraging, such as old fields and pastures, that provide habitat for rodents, and uses a variety of natural and man-made structures for nesting (COSEWIC 2010e)	No Habitat matching Criteria identified in Study Area.	No Studies Required	None Observed.	COSEWIC. 2010. COSEWIC assessment and status report on the Barn Owl <i>Tyto alba</i> (Eastern population and Western population) in Canada . Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiv + 34 pp.

APPENDIX 8. SPECIES AT RISK HABITAT ASSESSMENT
Guelph Pedestrian Bridges – Norwich

Project: AA16-047A

COMMON NAME	SCIENTIFIC NAME	SARO	COSEWIC	S-RANK	BACKGROUND SOURCES	HABITAT REQUIREMENTS	SUITABLE HABITAT IN STUDY AREA	FIELD STUDIES COMPLETED/ REQUIRED	OBSERVED BY A & A	Reference
Black Tern	<i>Chlidonias niger</i>	SC	NAR	S3B	MNRF (Wellington County)	Breeds in large, freshwater marshes, with emergent vegetation, and large areas of open water. Nests are typically within 6 meters of the water, on low emergent vegetation (Burke 2012).	No Habitat matching Criteria identified in Study Area.	No Studies Required	None Observed.	Peter S. Burke. 2012. Management Plan for the Black Tern (<i>Chlidonias niger</i>) in Ontario. Ontario Management Plan Series. Prepared for the Ontario Ministry of Natural Resources (OMNR), Peterborough, Ontario. vi + 47 pp.
Bobolink	<i>Dolichonyx oryzivorus</i>	THR	THR	S4B	BBS MNRF (Wellington County)	Nest in grassland habitats, including hayfields and meadows with a mixture of grasses and broad-leaved forbs with a high litter cover. Area Sensitive, with increased density in grasslands greater than 10ha (Renfrew et. al. 2015)	No Habitat matching Criteria identified in Study Area.	No Studies Required	None Observed.	Renfrew, R., A.M. Strong, N.G. Perlut, S.G. Martin and T.A. Gavin. 2015. Bobolink (<i>Dolichonyx oryzivorus</i>), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Birds of North America Online: http://bna.birds.cornell.edu/bna/species/176
Canada Warbler	<i>Wilsonia canadensis</i>	SC	THR	S4B	MNRF (Wellington County)	Prefers wet coniferous, deciduous and mixed forest types, with a dense shrub layer (COSEWIC 2008b).	No Habitat matching Criteria identified in Study Area.	No Studies Required	None Observed.	COSEWIC. 2008. COSEWIC assessment and status report on the Canada Warbler <i>Wilsonia Canadensis</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 35 pp. (www.sararegistry.gc.ca/status/status_e.cfm).
Cerulean Warbler	<i>Setophaga cerulea</i>	THR	END	S3B	MNRF (Wellington County), BBS	Occur in older, mature, deciduous forests, preferentially oak-maple composition, with a full, to partially open canopy, and little to no understory cover. Often in bottomland forests, or adjacent to treed swamplands (COSEWIC 2010f).	No Habitat matching Criteria identified in Study Area.	No Studies Required	None Observed.	COSEWIC. 2010. COSEWIC assessment and status report on the Cerulean Warbler <i>Dendroica cerulea</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 40 pp.
Chimney Swift	<i>Chaetura pelagica</i>	THR	THR	S4B, S4N	MNRF (Wellington County)	Typically nests in traditional chimneys of older buildings, which also provide roosting sites for many individuals during spring and fall migration (MNRF 2013).	No Habitat matching Criteria identified in Study Area. Nesting chimneys may be available on adjacent properties.	No Studies Required	None Observed.	MNRF. 2013. General Habitat Description for the Chimney Swift (<i>Chaetura pelagica</i>). Ontario Ministry of Natural Resources and Forestry. July 2, 2013.
Common Nighthawk	<i>Chordeiles minor</i>	SC	THR	S4B	MNRF (Wellington County), BBS	Breeds in open habitat, on the ground, in areas with no vegetation, including sand dunes, burned areas, open forests, railways, and gravel rooftops. Eggs are laid directly on the ground (COSEWIC 2007b).	No Habitat matching Criteria identified in Study Area.	No Studies Required	None Observed.	COSEWIC 2007. COSEWIC assessment and status report on the Common Nighthawk <i>Chordeiles minor</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 25 pp.
Eastern Meadowlark	<i>Sturnella magna</i>	THR	THR	S4B	MNRF (Wellington County), BBS	Nest in grassland habitats, including hayfields, pasture, savannahs, and other open areas. Preferential habitat includes areas with good grass and thatch (litter) cover (Jaster et. al. 2012).	No Habitat matching Criteria identified in Study Area.	No Studies Required	None Observed.	aster, Levi A., William E. Jensen and Wesley E. Lanyon. (2012). Eastern Meadowlark (<i>Sturnella magna</i>), The Birds of North America (P. G. Rodewald, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America: https://birdsna.org/Species-Account/bna/species/easmea
Eastern Whip-poor-will	<i>Caprimulgus vociferus</i>	THR	THR	S4B	MNRF (Wellington County)	Often found breeding in semi-open habitats, with little ground cover, and canopy openings allowing light to penetrate the forest floor, often associated with pine or oak, savannahs and barrens, early-successional poplar stands and open conifer plantations (COSEWIC 2009a)	No Habitat matching Criteria identified in Study Area.	No Studies Required	None Observed.	COSEWIC. 2009. COSEWIC assessment and status report on the Whip-poor-will <i>Caprimulgus vociferus</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 28 pp.
Eastern Wood-pewee	<i>Contopus virens</i>	SC	SC	S4B	MNRF (Wellington County), BBS	Associated with mid-age mixed and deciduous forest stands, often dominated by Maple (<i>Acer</i>), Elm (<i>Ulmus</i>) or Oak (<i>Quercus</i>), and include areas with clear-cuts, openings or forest edges. Also prefers forest stands with little to no understory vegetation (COSEWIC 2012a).	No Habitat matching Criteria identified in Study Area.	No Studies Required	None Observed.	? COSEWIC. 2012. COSEWIC assessment and status report on the Eastern Wood-pewee <i>Contopus virens</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 39 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).
Golden-winged Warbler	<i>Vermivora chrysoptera</i>	SC	THR	S4B	MNRF (Wellington County)	Nests in early successional shrub habitat, with adjacent forest edges for singing perches, often in hydro cut-overs, recently logged areas and beaver marshes (COSEWIC 2006a).	No Habitat matching Criteria identified in Study Area.	No Studies Required	None Observed.	COSEWIC 2006. COSEWIC assessment and status report on the Golden-winged Warbler <i>Vermivora chrysoptera</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 30 pp.
Henslow's Sparrow	<i>Ammodramus henslowii</i>	END	END	SHB	MNRF (Wellington County)	Breeds in grassland habitat, and is area sensitive. Grasslands with tall, dense cover a thick thatch layer, and are greater than 30ha, but preferentially larger than 100ha are preferred (COSEWIC 2011b).	No Habitat matching Criteria identified in Study Area.	No Studies Required	None Observed.	COSEWIC. 2011. COSEWIC assessment and status report on the Henslow's Sparrow <i>Ammodramus henslowii</i> in Canada. Committee on the Status of Endangered Wildlife in Canada . Ottawa. x + 37 pp.
Least Bittern	<i>Ixobrychus exilis</i>	THR	THR	S4B	MNRF (Wellington County)	Breeds in large marshes (>5ha) with emergent vegetation, typically cattails, with at least 50% open water, and relatively stable water levels (COSEWIC 2009b).	No Habitat matching Criteria identified in Study Area.	No Studies Required	None Observed.	COSEWIC. 2009. COSEWIC assessment and update status report on the Least Bittern <i>Ixobrychus exilis</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 36 pp.

COMMON NAME	SCIENTIFIC NAME	SARO	COSEWIC	S-RANK	BACKGROUND SOURCES	HABITAT REQUIREMENTS	SUITABLE HABITAT IN STUDY AREA	FIELD STUDIES COMPLETED/ REQUIRED	OBSERVED BY A & A	Reference
Loggerhead Shrike	<i>Lanius ludovicianus</i>	END	END	S2B	MNRF (Wellington County)	Nests in open, low, grassy habitat with scattered shrubs. Presence of thorny shrubs, such as hawthorn, or barbwire fencing required for impaling prey. Only two recent areas of breeding in the province (Carden Plain and Napanee Plain) (Environment Canada 2015).	No Habitat matching Criteria identified in Study Area.	No Studies Required	None Observed.	Environment Canada. 2015. Recovery Strategy for the Loggerhead Shrike, migrans subspecies (<i>Lanius ludovicianus migrans</i>), in Canada. Species at Risk Act Recovery Strategy Series. Environment Canada, Ottawa. vii + 35 pp.
Louisiana Waterthrush	<i>Seiurus motacilla</i>	SC	THR	S3B	MNRF (Wellington County)	Nests along headwater streams and associated wetlands which occur within large tracts of mature forest especially mixed wood forests with a component of hemlock. Nests are located in stream bank niches, under mossy logs, and within the roots of fallen trees (COSEWIC 2006b)	No Habitat matching Criteria identified in Study Area.	No Studies Required	None Observed.	COSEWIC 2006. COSEWIC assessment and update status report on the Louisiana Waterthrush <i>Seiurus motacilla</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 26 pp. (www.sararegistry.gc.ca/status/status_e.cfm).
Northern Bobwhite	<i>Colinus virginianus</i>	END	END	S1	MNRF (Wellington County)	Requires early successional habitat with a mix of croplands, dense brush cover and grassland in close proximity for feeding, dusting, roosting, escaping predators and nesting. Only known self-sustaining population found on Walpole island (COEWSIC 2003).	No Habitat matching Criteria identified in Study Area.	No Studies Required	None Observed.	COSEWIC 2003. COSEWIC assessment and update status report on the Northern Bobwhite <i>Colinus virginianus</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 20 pp.
Olive-sided Flycatcher	<i>Contopus cooperi</i>	SC	THR	S4B	MNRF (Wellington County)	Associated with natural forest openings (usually conifer or mixed), and edges of forests adjacent wetlands or watercourses, will also use open and semi-open forests and clear-cuts. Presence of tall snags and residual live trees required for nesting and foraging (COSEWIC 2007c).	No Habitat matching Criteria identified in Study Area.	No Studies Required	None Observed.	COSEWIC. 2007. COSEWIC assessment and status report on the Olive-sided Flycatcher <i>Contopus cooperi</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 25 pp.
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	SC	THR	S4B	MNRF (Wellington County) , BBS	Found in a variety of open areas, with a high density of dead or dying trees, particularly forests dominated by oak or beech (COSEWIC 2007d).	No Habitat matching Criteria identified in Study Area.	No Studies Required	None Observed.	COSEWIC 2007. COSEWIC assessment and update status report on the Red-headed Woodpecker <i>Melanerpes erythrocephalus</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 27 pp.
Short-eared Owl	<i>Asio flammeus</i>	SC	SC	S2N, S4B	MNRF (Wellington County)	Breeds in grassland habitat, including pasture and hayfields, meadow marshes and occasionally agricultural fields, nests are scrapes, located on the ground (COSEWIC 2008c).	No Habitat matching Criteria identified in Study Area.	No Studies Required	None Observed.	COSEWIC. 2008. COSEWIC assessment and update status report on the Short-eared Owl <i>Asio flammeus</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 24 pp.
Wood Thrush	<i>Hylocichla mustelina</i>	SC	THR	S4B	BBS	Prefers second growth moist deciduous forests, with tall trees, and a dense understory of low saplings and an open forest floor with decaying leaf litter. Often nests in saplings, shrubs or occasionally dead stumps (COSEWIC 2012b).	No Habitat matching Criteria identified in Study Area.	No Studies Required	None Observed.	COSEWIC. 2012. COSEWIC assessment and status report on the Wood Thrush <i>Hylocichla mustelina</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 46 pp.
Yellow-breasted Chat	<i>Icteria virens</i>	END	END	S2B	MNRF (Wellington County)	Shrub specialist, nesting in early successional, dense, low-shrub habitat, including old fields, hydro-cutovers and forest edges experiencing regeneration (COSEWIC 2011c).	No Habitat matching Criteria identified in Study Area.	No Studies Required	None Observed.	COSEWIC. 2011. COSEWIC assessment and status report on the Yellow-breasted Chat <i>Icteria virens</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xvi + 51 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).
Fish										
Black Redhorse	<i>Moxostoma duquesnei</i>	THR	THR	S2	MNRF (Wellington County)	Associated with cool, clear streams of moderate size with substrates of rocky, cobble, sand or silt. Found in the Lake Erie and Grand River Watersheds (COSEWIC, 2005a).	Habitat matching criteria within Study Area. Not known to occur in the Speed or Eramosa Rivers.	GRCA Fish Sampling Records	None Observed.	COSEWIC 2005. COSEWIC assessment and update status report on the black redhorse <i>Moxostoma duquesnei</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 21 pp.
Redside Dace	<i>Clinostomus elongatus</i>	END	END	S2	MNRF (Wellington County)	Associated with small, clear, head water streams and creeks with abundant overhanging vegetation and both pool and riffle habitat, often with gravel substrates and cool water temperature regimes (COSEWIC, 2007e).	No Habitat matching Criteria identified in Study Area.	GRCA Fish Sampling Records	None Observed.	COSEWIC 2007. COSEWIC assessment and update status report on the Redside Dace <i>clinostomus elongatus</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. Vii + 59pp.
Silver Shiner	<i>Notropis photogenis</i>	THR	THR	S2S3	MNRF (Wellington County)	Associated with large, wide streams (usually >20m) in deep riffles and pools, with substrates of gravel, boulder, rubble and sand (COSEWIC, 2011d).	No Habitat matching Criteria identified in Study Area.	GRCA Fish Sampling Records	None Observed	COSEWIC 2011. COSEWIC assessment and status report on the Silver Shiner in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 45 pp.
Mammals										

APPENDIX 8. SPECIES AT RISK HABITAT ASSESSMENT
Guelph Pedestrian Bridges – Norwich

Project: AA16-047A

COMMON NAME	SCIENTIFIC NAME	SARO	COSEWIC	S-RANK	BACKGROUND SOURCES	HABITAT REQUIREMENTS	SUITABLE HABITAT IN STUDY AREA	FIELD STUDIES COMPLETED/ REQUIRED	OBSERVED BY A & A	Reference
Eastern Small-footed Myotis	<i>Myotis leibii</i>	END	NA	S2S3	MNRF (Wellington County)	Associated with hilly or mountainous terrain, in or near coniferous or deciduous forest habitat. Maternity roosts located in cracks and crevices of talus slopes and rocky outcrops, or, occasionally in bridges, old buildings, hollow trees (or loose bark) and caves and mines during the maternity season. Hibernate singly or in small clusters in mines and caves (NatureServe, 2015).	No Habitat matching Criteria identified in Study Area.	No Studies Required	None Observed.	COSEWIC. 2013. COSEWIC assessment and status report on the Little Brown Myotis <i>Myotis lucifugus</i> , Northern Myotis <i>Myotis septentrionalis</i> and Tri-colored Bat <i>Perimyotis subflavus</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxiv + 93 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).
Little Brown Myotis	<i>Myotis lucifugus</i>	END	END	S4	MNRF (Wellington County)	Hibernate in Caves; maternity colonies located in warm sites, often associated with human habitation; including attics, old buildings, under bridges, rock crevices and cavities in canopy trees in wooded areas (COSEWIC, 2013c).	Although Trees of sufficient size were observed in the study area, they did not meet the majority of the criteria to be considered candidate maternity Trees. Trees within study area not suitable for maternity roosts.	No Studies Required	None Observed.	COSEWIC. 2013a COSEWIC assessment and status report on the Little Brown Myotis <i>Myotis lucifugus</i> , Northern Myotis <i>Myotis septentrionalis</i> and Tri-colored Bat <i>Perimyotis subflavus</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxiv + 93 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).
Northern Myotis	<i>Myotis septentrionalis</i>	END	END	S3	MNRF (Wellington County)	Hibernate in Caves; maternity colonies usually located in trees, and are closely associated with specific tree characteristics and density of suitable trees. Characterized by tall, large diameter trees in early stages of decay, located in openings in mature forest canopies (COSEWIC, 2013c).	Although Trees of sufficient size were observed in the study area, they did not meet the majority of the criteria to be considered candidate maternity Trees. Trees within study area not suitable for maternity roosts.	No Studies Required	None Observed.	COSEWIC. 2013. COSEWIC assessment and status report on the Little Brown Myotis <i>Myotis lucifugus</i> , Northern Myotis <i>Myotis septentrionalis</i> and Tri-colored Bat <i>Perimyotis subflavus</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxiv + 93 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).
Molluscs										
Rainbow Mussel	<i>Villosa iris</i>	THR	SC	S2S3	MNRF (Wellington County)	Usually occur in small to medium rivers, or occasionally inland lakes; within or near riffles and substrates are typically a mix of cobble, gravel and sand. Most abundant in clean, well-oxygenated waters (COSEWIC, 2006b).	Poor habitat quality. Species not currently or historically known to occur in area (DFO 2016)	No Studies Required	None Observed	COSEWIC 2006. COSEWIC assessment and status report on the Rainbow mussel <i>Villosa iris</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 38 pp.
Wavy-rayed lampmussel	<i>Lampsilis fasciola</i>	THR	SC	S1	MNRF (Wellington County)	Occur in clear, flowing rivers and large creeks, in riffle areas with sand or gravel substrates, and occasional large substrates (COSEWIC, 2010g)	Poor habitat quality. Species not currently or historically known to occure in area (DFO 2016)	No Studies Required	None Observed	COSEWIC. 2010. COSEWIC assessment and status report on the Wavy-rayed Lampmussel <i>Lampsilis fasciola</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 60 pp.
Reptiles										
Blanding's Turtle	<i>Emydoidea blandingii</i>	THR	THR	S3	MNRF (Wellington County)	Use a variety of eutrophic wetland habitat types, including lakes, ponds, watercourses, marshes, man-made channels, farm fields, coastal areas and bays. Seasonal overland terrestrial movements up to 2.5 km occur to reach nesting and overwintering areas, generally through wooded coniferous or mixed forest habitat. Nests are usually laid in loose sand or organic soil (COSEWIC 2005b).	No Habitat matching Criteria identified in Study Area.	No Studies Required	None Observed	COSEWIC 2005. COSEWIC assessment and update status report on the Blanding's Turtle <i>Emydoidea blandingii</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. viii + 40 pp. (www.sararegistry.gc.ca/status/status_e.cfm).
Snapping Turtle	<i>Chelydra serpentina</i>	SC	SC	S3	MNRF (Wellington County) (ORAA 2015)	Inhabit slow-moving waters with soft, muck bottom and dense aquatic vegetation. Ponds, sloughs and shallow bays are all often used as summering and overwintering habitat (COSEWIC 2008d).	Habitat present within the study area. Presence of overwintering habitat has not been evaluated.	No Studies Required	Observed by A & A during ELC	COSEWIC. 2008. COSEWIC assessment and status report on the Snapping Turtle <i>Chelydra serpentina</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 47 pp. (www.sararegistry.gc.ca/status/status_e.cfm).
Spotted Turtle	<i>Clemmys guttata</i>	END	END	S3	MNRF (Wellington County)	Found in wetlands with high organic content, including bogs, fens, marshes, woodland streams, sedge meadows, and shallow bays. Only one population is known from Wellington County, in Luther Marsh. Preferential to unpolluted shallow water with aquatic vegetation and soft substrates. Presence of Sphagnum moss, sedge tussocks, cattails and water lilies, may be important to Canadian populations (COSEWIC, 2002b).	No Habitat matching Criteria identified in Study Area.	No Studies Required	None Observed.	COSEWIC 2004. COSEWIC assessment and update status report on the spotted turtle <i>Clemmys guttata</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 27 pp. (www.sararegistry.gc.ca/status/status_e.cfm).

APPENDIX 8. SPECIES AT RISK HABITAT ASSESSMENT
Guelph Pedestrian Bridges – Norwich

Project: AA16-047A

COMMON NAME	SCIENTIFIC NAME	SARO	COSEWIC	S-RANK	BACKGROUND SOURCES	HABITAT REQUIREMENTS	SUITABLE HABITAT IN STUDY AREA	FIELD STUDIES COMPLETED/ REQUIRED	OBSERVED BY A & A	Reference
Butler's Gartersnake	<i>Thamnophis butleri</i>	END	END	S2	MNRF (Wellington County)	Occupies open areas with dense grass and thatch cover, including tall grass prairie, old fields, abandoned sites in urban areas, drainage swales and seasonally dry marshes. Only one population is known from Wellington County, in Luther Marsh. Artificial cover features such as plywood, concrete, shingles, metal sheets etc., increases probability of encounters, but is not essential (COSEWIC, 2010h).	No Habitat matching Criteria identified in Study Area.	No Studies Required	None Observed.	COSEWIC. 2010. COSEWIC assessment and status report on the Butler's Gartersnake Thamnophis butler in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 51 pp.
Eastern Ribbonsnake	<i>Thamnophis sauritus</i>	SC	SC	S3	MNRF (Wellington County) (NHIC 1990), (ORAA 1985)	A semi-aquatic species that inhabits dense, low-vegetation, edges of ponds, streams, marshes, fens and bogs, with open sunlit areas for basking (COSEWIC 2002c).	No Habitat matching Criteria identified in Study Area.	No Studies Required	None Observed.	COSEWIC 2002. COSEWIC assessment and status report on the eastern ribbonsnake Thamnophis sauritus. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 24 pp.
Massassauga Rattlesnake	<i>Sistrurus catenatus</i>	SC	THR	S3	MNRF (Wellington County)	Only historic observations of Masassauga in the north western portion of Wellington County. Found in wet prairies, old fields, peatlands, rock barrens and coniferous forests, with open-areas, and areas of dense shrub cover. Hibernate in damp areas below the frost line (COSEWIC, 2012b).	No Habitat matching Criteria identified in Study Area.	No Studies Required	None Observed.	COSEWIC. 2012. COSEWIC assessment and status report on the Massasauga Sistrurus catenatus in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii + 84 pp.
Milksnake	<i>Lampropeltis triangulum</i>			S3	MNRF (Wellington County)	Habitat generalists often associated with edge habitat, meadows, prairies, pastures, rocky outcrops and human disturbances such as hydro corridors and railway embankments. Habitat is usually close to a water source. Hibernation occurs in a variety of natural and man-made features, including rotting logs, old foundations, basements and burrows (COSEWIC 2014).	Poor habitat quality, species unlikely to occur.	No Studies Required. No longer listed as SAR	None Observed	COSEWIC. 2014. COSEWIC assessment and status report on the Eastern Milksnake Lampropeltis triangulum in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 61 pp.
Vascular Plants										
American Chestnut	<i>Castanea dentata</i>	END	END	S2	MNRF (Wellington County)	Typically occur in upland deciduous forests in Southern Ontario with dry, sandy, acid-neutral soils, Typical associates include Red Oak, Black Cherry, Sugar Maple, American Beech, White Ash, White Oak, Red Maple and Sassafras (COSEWIC 2004).	No Habitat matching Criteria identified in Study Area.	ELC Survey	None Observed.	COSEWIC 2004. COSEWIC assessment and status report on the American chestnut Castanea dentata in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 19 pp. www.sararegistry.gc.ca/status/status_e.cfm
American Ginseng	<i>Panax quinquefolius</i>	END	END	S2	MNRF (Wellington County)	Occur in moist, rich, undisturbed, mature Sugar Maple dominated deciduous woodlands. Often, colonies are located at the bottom of south facing slopes (COSEWIC, 2000).	No Habitat matching Criteria identified in Study Area.	ELC Survey	None Observed.	COSEWIC 2000. COSEWIC assessment and update status report on the American ginseng Panax quinquefolius in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 17 pp.
Butternut	<i>Juglans cinerea</i>	END	END	S3?	MNRF (Wellington County)	Occur in rich moist sites, that are well-drained, often found along stream banks or gravelly sites. Butternut is shade intolerant (COSEWIC, 2003b).	Poor habitat quality, species unlikely to occur.	ELC Survey	None Observed	COSEWIC 2003. COSEWIC assessment and status report on the butternut Juglans cinerea in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 32 pp. www.sararegistry.gc.ca/status/status_e.cfm
Hill's Pondweed	<i>Potamogeton hillii</i>	SC	SC	S2	MNRF (Wellington County)	Occur in cold clear calcareous streams, ponds and ditches, which are alkaline in nature (COSEWIC 2005c).	No Habitat matching Criteria identified in Study Area.	ELC Survey	None Observed.	COSEWIC 2005c COSEWIC assessment and update status report on the Hill's pondweed Potamogeton hillii in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 19 pp.

References:

Cadman, M.D.,D.A. Sutherland, G.G. Beck, D. Lepage, and A.R. Couturier. 2007. The Atlas of the Breeding Birds Ontario 2001-2005. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto,xxii + 706pp. (Available online here: <http://www.birdsontario.org/atlas/datasummaries.jsp>)

Colin Jones, Ross Layberry, and Alan Macnaughton. Ontario Butterfly Atlas Online. (April 30, 2015). (Available online here: Toronto Entomologists’ Association: http://www.ontarioinsects.org/atlas_online.htm)

Dobbyn, J. 1994. Atlas of the Mammals of Ontario. Federation of Ontario Naturalists, Altona Manitoba, Canada. (available online here: <http://www.ontarionature.org/discover/resources/publications.php>)

MNRF, 2015. Wellington County Upper Tier Species at Risk. Ministry of Natural Resources and Forestry. Provided February 10, 2015.

NatureServe. 2015. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://explorer.natureserve.org>. (Accessed: January 5, 2016).

NHIC, 2015. MNRF Make a map: Natural Heritage Areas. (Available online: <http://www.ontario.ca/environment-and-energy/make-natural-heritage-area-map>)

Guelph Pedestrian Bridges – Norwich

Ontario Nature. 2015. Ontario Reptile and Amphibian Atlas: a citizen science project to map the distribution of Ontario’s reptiles and amphibians. Ontario Nature, Ontario. (Available onlnie here: <http://www.ontarionature.org/atlas>; Accessed April 29, 2015].

DFO. 2016. Fisheries and Oceans Canada. Aquatic Species at Risk (Mapping). (Available online: <http://www.dfo-mpo.gc.ca/species-especies/listing-eng.htm>)

COSEWIC. 2013. COSEWIC assessment and status report on the Dun Skipper (vestris subspecies), *Euphyes vestris vestris* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 69 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).

APPENDIX 9
AQUATIC HABITAT ASSESSMENT

AQUATIC HABITAT ASSESSMENT

Project: Norwich Project Number: AA16-047A

Weather
Condition

Air Temp (°C)	Wind*	Cloud Cover	Precipitation	Precipitation (24hrs)
27	2	30	No	Yes

Observer(s): RH Date: Aug/17/2016

Station 1

WATER TEMP (°C)	STATION LENGTH	MEAN CHANNEL WIDTH	MEAN DEPTH		STREAM SHADING %	BUFFER WIDTH		PHOTOS RANGE	GPS
			CHANNEL	WATER		UP-S LEFT	UP-S RIGHT		UP-S: <u>NA</u>
21°C	60m	16m	+50 cm	30 -50 cm	40%	10 m	10 m	Yes	DN-S: <u>NA</u>
SUBSTRATE %		FLOW PATTERN		CHANNEL MORPHOLOGY		IN-STREAM COVER (%)		BANK	
55% Fines 20% Gravel 25% Cobble		80% Flat with pools 20% Small riffles (Outside study area limits)		Entrenched channel within little to no meanders at location of site. Small riffles upstream and downstream, but not in site		10% Wood debris		- Hardened channel walls at bridge. - Unstable banks with some evidence of erosion.	

Station Notes: Entrenched channel steep banks. Little to no aquatic vegetation within watercourse. Substrate is mostly firm with no identified areas of deep organic matter or muck.

- SUBSTRATE:** Organic; Clay (hard pan); Fines (silt, clay); Sand (0.06 - 2mm); Gravel (2 - 65 mm); Cobble (65 - 250 mm); Boulder (>250mm); Bedrock.
- FLOW PATTERN:** Flat; Pools; Riffles; Runs; Eddy.
- CHANNEL MORPHOLOGY:** Channelized; Straight; Meander; Channel Hardening.
- IN-STREAM COVER %:** Aquatic Vegetation, Floating Vegetation, Emergent Vegetation, **Wood**; Rock; Debris.
- BANK:** Unstable; Undercut; Bare; Hardened; Vegetated; Cultural.

Project:: Ward to downtown Project Number: AA16-047A Observer(s) RH Date: Aug 17 2016

<u>SITE FEATURES:</u>	Ongoing and Active	Historical Evidence	Probable	No Evidence	Unknown	Comment
Point and Non-Point Contaminant Sources	✓					Roads and development activity within vicinity.
Major Nutrient Sources Up-Stream				✓		
Channel Hardening or Straightening	✓					Concrete abutments of bridge
Adjacent Land Use that Destabilizes Banks				✓		
Sediment Loading					✓	
In-Stream Habitat Modification	✓					Bridges
High Fishing Pressure					✓	
Log Jam Deflectors				✓		
Springs or Seep				✓		
Impervious Substrate				✓		
Other Activities that Could Influence Habitat	✓					Stream modification, narrow riparian buffers, residential properties close to bank.
Barrier to Fish Passage	✓					Up-stream and down-stream barriers to fish passage, but none in station.

Guelph Pedestrian Bridges - Norwich

COMMON NAME	SCIENTIFIC NAME	COSARO	COSEWIC	SARA	S-Rank	G-Rank
Smallmouth Bass	<i>Micropterus dolomieu</i>				S5	G5
Mottled Scuplin	<i>Cottus bairdii</i>				S5	G5
White Sucker	<i>Catostomus commersonii</i>				S5	G5
Greenside Darter	<i>Etheostoma blennioides</i>				S4	G5
Rainbow Darter	<i>Etheostoma caeruleum</i>				S4	G5
Eastern Blacknose Dace	<i>Rhinichthys atratulus</i>				S5	G5
Longnose Dace	<i>Rhinichthys cataractae</i>				S5	G5
Creek Chub	<i>Semotilus atromaculatus</i>				S5	G5
Yellow Perch	<i>Perca flavescens</i>				S5	G5
Brown Bullhead	<i>Ameiurus nebulosus</i>				S5	G5
Black Crappie	<i>Pomoxis nigromaculatus</i>				S4	G5
Brook Stickleback	<i>Culaea inconstans</i>				S5	G5
Creek Chub	<i>Semotilus atromaculatus</i>				S5	G5
Common Shiner	<i>Luxilus cornutus</i>				S5	G5
Pearl Dace	<i>Margariscus nachtriebi</i>				S5	G5
Johnny Darter	<i>Etheostoma nigrum</i>				S5	G5
Rock Bass	<i>Ambloplites rupestris</i>				S5	G5
Bluntnose Minnow	<i>Pimephales notatus</i>				S5	G5
Common Carp	<i>Cyprinus carpio</i>				SNA	G5
Rosyface Shiner	<i>Notropis rubellus</i>				S4	G5

Data Source:

GRCA: E-mail from Jason Wagler, Resource Planner, Dated April 2, 2016. Original source of records not provided.

All sampling records are from between Guelph Lake and the confluence with the Speed River and Eramosa River.

Legend:

COSARO: Committee on Species at Risk Ontario

COSEWIC: Committee on the Status of Endangered Wildlife in Canada

SARA: Species at Risk Act

ESA: Endangered Species Act

END: Endangered

THR: Threatened

SC: Special Concern

NAR: Not At Risk

NL: Not listed

DD: Data Deficient

G-Rank: Global Rank

G1: Extremely rare globally

G1G2: Extremely rare to very rare globally

G2: Very rare globally

G2G3: Very rare to uncommon globally

G3: Rare to uncommon globally

G3G4: Rare to common globally

G4: Common globally

G4G5: Common to very common globally

G5: Very common globally; demonstrably secure

T: rank applies to a subspecies or variety

S-Rank: Provincial Rank

S1: Critically Imperiled—Critically imperiled in the province

S2: Imperiled—Imperiled in the province, very few populations

S3: Vulnerable—Vulnerable in the province, few populations

S4: Apparently Secure—Uncommon but not rare

S5: Secure—Common, widespread, and abundant in the province

SX: Presumed extirpated

SH: Possibly Extirpated (Historical)

SNR: Unranked

SU: Unrankable—Currently unrankable due to lack of information

SNA: Not applicable—conservation status rank is not applicable

S#S#: Range Rank—range of uncertainty about the status

S#B- Breeding status rank

S#N- Non Breeding status rank

?: Indicates uncertainty in the assigned rank

Glossary of Terms and Impacts

Duration of Impact

ST – Short-term (define based on project)

LT- Long-term (define based on project)

Reversibility

R- Reversible

P – Permanent

Direction

P - Positive.

A - Adverse.

Geographic Extent of Influence

SA– Subject Area (physical disturbance area)

AA- Assessment Area (120m zone of influence)

LA – Landscape Area (Area outside AA that may be affected)

Frequency of Disturbance

O - Occurs once.

S - Occurs sporadically at irregular intervals.

R - Occurs on a regular basis and at regular intervals.

C – Continuous, ongoing and all the time.

Existing Ecological Site Context

U - Undisturbed: Area relatively or not adversely affected by human activity.

PD – Past Disturbance: Area Adversely affected by human activity in recent past, but regeneration has occurred.

D -Disturbed: Area has been substantially previously disturbed by human development or human development is still present.

Likelihood of impact occurring

If the Proposed activity occurs, the likelihood of the impact occurring is:

L: Low probability of occurrence.

M: Medium probability of occurrence.

H: High probability of occurrence.

Cumulative Environmental Effects

Will the proposed activity interact with other impacts?

Y: Potential for environmental effect to interact with the environmental effects of other past, present or foreseeable future activities

N: Environmental effect will not or is not likely to interact with the environmental effects of other past, present or foreseeable future activities.

Impact Rating

None: An event that, if it occurs, will cause no foreseeable impact.

Minor: An event that, if it occurs, will cause small, reversible and geographically localized impact that can be easily mitigated.

Moderate: Significant but reversible, OR irreversible and geographically localized, impact that requires significant mitigation.

Severe: Significant AND irreversible impact on the environment, impacts cannot be fully mitigated.

Potential vs. Actual impact

¹ *Potential Impact* is a relative rating of the expected impact to occur in the absence of any mitigation measures.

² *Actual Impact* is the expected impact in consideration of implementation of mitigation measures or where potential impact may cause little to no actual impact.

APPENDIX 12. TREE SURVEY DATA
Guelph Pedestrian Bridges - Norwich

Project: AA16-047A

Tree No.	Species/Common Name	DBH ¹ (cm)	Crown Dia. (m. est.)	MTPZ ² , (m) (from outer trunk of tree)	Biological Health (Low, Mod, High)	Structural Condition (Low, Mod, High)	Overall Condition (Dead, Poor, Fair, Good, Excellent)	Ownership: Private, Offsite, Municipal, Shared	Observations	Recommended
559	<i>Acer negundo</i> Manitoba Maple	37 [26,22,10,10]	10	2.4	M	ML	F		ct m;	
560	<i>Juglans nigra</i> Black Walnut	25	8	1.8	HM	HM	G			
561	<i>Acer negundo</i> Manitoba Maple	63 [33,30,26,26, 25]	15	4.2	ML	LL	P		tl h w; cd m; stem in river;	
562	<i>Ulmus americana</i> White Elm	33	8	2.4	M	M	F		beaver damage l;	
563	<i>Juglans nigra</i> Black Walnut	52 [33,31,25]	10	3.6	HM	MM	G			
564	<i>Juglans nigra</i> Black Walnut	17	5	1.8	H	HM	G			
565	<i>Juglans nigra</i> Black Walnut	14	4	1.8	HM	MM	G			
566	<i>Acer negundo</i> Manitoba Maple	73 [45,35,30,25, 25]	15	4.8	HM	ML	F			
567	<i>Acer negundo</i> Manitoba Maple	21 [16,14]	15	1.8	HM	ML	F			
568	<i>Acer negundo</i> Manitoba Maple	38 [20,18,18,16, 12]	10	2.4	M	ML	F			
569	<i>Acer negundo</i> Manitoba Maple	23 [15,15,9]	6	1.8	ML	LL	F		1 stem in river	
570	<i>Acer negundo</i> Manitoba Maple	11	6	1.8	ML	LL	P		tl h ne;	
571	<i>Acer negundo</i> Manitoba Maple	15	5	1.8	M	L	P		cu h ne;	
572	<i>Acer negundo</i> Manitoba Maple	30 [21,17,12]	6	2.4	ML	ML	P		cd m;	
573	<i>Juglans nigra</i> Black Walnut	21	5	1.8	HM	HM	G			
574	<i>Acer negundo</i> Manitoba Maple	14	3	1.8	ML	ML	P		cd h;	
575	<i>Acer negundo</i> Manitoba Maple	22 [21,8]	6	1.8	ML	ML	P		tl h w; tb m;	
576	<i>Acer negundo</i> Manitoba Maple	18	6	1.8	M	M	F			
577	<i>Picea glauca</i> White Spruce	25	5	1.8	ML	LM	F		ct m;	
578	<i>Picea glauca</i> White Spruce	21	5	1.8	ML	LM	F		ct m;	
579	<i>Picea glauca</i> White Spruce	14	4	1.8	ML	LM	F		ct m;	
580	<i>Pinus nigra</i> Austrian Pine	39	8	2.4	HM	MM	G			

APPENDIX 12. TREE SURVEY DATA
Guelph Pedestrian Bridges - Norwich

Project: AA16-047A

Tree No.	Species/Common Name	DBH ¹ (cm)	Crown Dia. (m. est.)	MTPZ ² , (m) (from outer trunk of tree)	Biological Health (Low, Mod, High)	Structural Condition (Low, Mod, High)	Overall Condition (Dead, Poor, Fair, Good, Excellent)	Ownership: Private, Offsite, Municipal, Shared	Observations	Recommended
581	<i>Pinus nigra</i> Austrian Pine	34	8	2.4	HM	MM	F		ct m;	
582	<i>Acer negundo</i> Manitoba Maple	39 [20,18,16,16]	12	2.4	M	L	P		tm m;	
583	<i>Acer negundo</i> Manitoba Maple	52 [38,35]	10	3.6	M	L	P		response wood at base m;	
584	<i>Acer negundo</i> Manitoba Maple	14	4	1.8	M	L	P		tl h se;	
585	<i>Acer negundo</i> Manitoba Maple	30 [25,16]	6	2.4	M	L	P		tl h e;	
586	<i>Ulmus americana</i> White Elm	57	12	3.6	HM	MM	F		cu h se;	
587	<i>Acer negundo</i> Manitoba Maple	64 [46,45]	12	4.2	M	L	P		cu h se; cb h;	
588	<i>Acer negundo</i> Manitoba Maple	74 [47,44,36]	14	4.8	M	L	P		cu h se; cd m; td m;	
589	<i>Acer negundo</i> Manitoba Maple	45 [38,25]	10	3	M	L	P		tl h sw; bn h; cd m;	
590	<i>Acer negundo</i> Manitoba Maple	35 [29,17,11]	8	2.4	M	L	P		tl h sw; cd m;	
592	<i>Acer negundo</i> Manitoba Maple	28	8	1.8	M	L	P		tl h sw;	
593	<i>Acer negundo</i> Manitoba Maple	56 [53,17]	10	3.6	M	L	P		tl h sw; cb h;	
594	<i>Acer negundo</i> Manitoba Maple	55	14	3.6	M	L	F		tc m; observed from other side of river;	
595	<i>Acer negundo</i> Manitoba Maple	43 [35,25]	10	3	HM	MM	F		observed from other side of river;	
595	<i>Juglans nigra</i> Black Walnut	20	7	1.8	H	HM	G		observed from other side of river;	
596	<i>Acer negundo</i> Manitoba Maple	17 [14,10]	6	1.8	M	M	F		observed from other side of river;	
596	<i>Acer negundo</i> Manitoba Maple	19 [16,10]	8	1.8	M	M	F		observed from other side of river;	
597	<i>Acer negundo</i> Manitoba Maple	35	6	2.4	ML	LL	P		observed from bridge; cb h;	
598	<i>Acer negundo</i> Manitoba Maple	49 [40,28]	10	3	M	ML	P		observed from bridge; tb h;	
599	<i>Acer negundo</i> Manitoba Maple	45 [30,30,15]	12	3	M	L	P		observed from bridge; tl h w;	
601	<i>Acer negundo</i> Manitoba Maple	45	14	3	M	L	P		observed from bridge;); tl h w;	
602	<i>Acer negundo</i> Manitoba Maple	40	10	2.4	M	ML	P		observed from bridge; tc h (2 locations); tb m;	

APPENDIX 12. TREE SURVEY DATA

Guelph Pedestrian Bridges - Norwich

Project: AA16-047A

Tree No.	Species/Common Name	DBH ¹ (cm)	Crown Dia. (m. est.)	MTPZ ² , (m) (from outer trunk of tree)	Biological Health (Low, Mod, High)	Structural Condition (Low, Mod, High)	Overall Condition (Dead, Poor, Fair, Good, Excellent)	Ownership: Private, Offsite, Municipal, Shared	Observations	Recommended
Overall Condition - Dead								0		
Overall Condition - Poor								21		
Overall Condition - Fair								16		
Overall Condition - Good								7		
Overall Condition - Excellent								0		
Subtotal								44		
Private (On Site) Trees								0		
Private (Off Site) Trees								0		
Municipal Trees								0		
Shared Trees								0		
Subtotal								0		

1. DBH (Diameter at breast height): Measurement of tree stem diameter at 1.4 meters above ground.

2. Tree Protection Zones, Specifications for Trees (SS-31) City of Guelph. February, 2012.

Removal of trees owned by others (e.g. private off-site, municipal or shared/boundary trees) require approval from the owner.

APPENDIX 13. TREE INVENTORY AND ASSESSMENT DEFINITIONS

Note: Not all definitions may apply.

DBH (cm): Diameter at breast height, 1.4 m above ground, measured in centimeters.

Numbers in square brackets [xx, xx, ...] denotes the DBH's of each stem of tree with multiple stems.

Height (metres): Height of tree from ground to top of crown. Height is estimated from visual ground observations.

Crown Diameter (meters): Diameter of tree canopy estimated in meters.

Minimum Tree Protection Zone (MTPZ): The minimum setback required to maintain the structural integrity of the tree's anchor roots, based on generally accepted arboricultural principles. If trees are protected to the TPZ then the tree's anchor root structure is expected to be maintained. Protection zone distances from: Specifications for Trees (SS-31) City of Guelph. February 2012.

Height (meters): Tree height from ground level at base of tree to top of canopy.

Biological Health: Related to presence and extent of disease/disease symptoms and the vigour of the tree.

H (High) - No diseases/disease symptoms present, and moderate to high vigour.

M (Moderate) - Presence of minor diseases/disease symptoms, and/or moderate vigour.

L (Low) - Presence of major diseases/disease symptoms, (i.e., extensive crown dieback), and/or poor vigour.

A further rating may be assigned of ML = Low side of Moderate, HM = Moderate side of High.

Structural Condition: Related to defects in a tree's structure, (i.e., lean, co-dominant trunks).

H (High) - No structural defects, well-developed crown.

M (Moderate) - Presence of minor structural defects.

L (Low) - Presence of major structural defects.

A further rating may be assigned of M(L) = Low side of Moderate, H(M) = Moderate side of High.

Overall Condition: Related to defects in a tree's structure, (i.e., lean, co-dominant trunks).

E (Excellent) - Balanced, full crown; limbs and branches well-spaced; moderate to high vigour. No structural defects; biologically healthy with no diseases / disease symptoms; no crown dieback

G (Good) - Full crown with small, incomplete sections; limbs and branches mostly well-spaced; moderate vigour. Presence of very minor structural defects and/or very minor diseases / disease symptoms; very minor dieback (<10%)

F (Fair) - Crown not full or with large incomplete sections; some limbs and branches missing and/or not well spaced; moderate to poor vigour. Presence of minor structural defects and/or minor diseases / disease symptoms; moderate dieback (10-30%)

P (Poor) - Crown severely unbalanced or with very reduced (<30%) live crown; many limbs and branches missing; severely poor vigour. Presence of major structural defects and/or presence of major diseases / disease symptoms; severe dieback (>30%)

D (Dead) - No leaves or no buds, fine branchlets/twigs missing or dried out and brittle, bark peeling off, limbs or branches fallen off, decay present and may be extensive

Ownership:

Private (On-site) Tree: Tree trunk located completely within the boundary of the subject property.

Off-site Tree: Tree trunk located on private property completely outside of the property boundary of the subject property.

Municipal Tree: Tree is located on the property of the municipality/region, e.g., within Right-of-Way.

Shared (Boundary) Tree: Tree located on property boundary of the subject property and adjacent private or public property.

Recommended Action: A recommendation of the following three categories is assigned to preserve or remove a tree:

i) The tree's current biological health and structural condition

ii) The anticipated impacts from proposed development

iii) The summary of the previous two categories. Note: Only trees having a recommendation of preserve for both health and structure, and impacts from the proposed development are assigned a final recommendation of preserve.

P (Preserve) - Tree typically has a Biological Health rating of Moderate Low or higher AND a Structural Condition rating of Moderate Low or higher, AND is likely to survive impact from the proposed development (if present). The tree is likely to survive for at least 5 to 10 years.

R (Remove) - Tree typically has a Biological Health rating of Low, AND/OR a Structural Condition rating of Low, AND/OR will not survive the proposed development impacts (if present). The tree is not likely to survive more than 3 to 5 years.

T (Transplant) - The following conditions must be met for a tree to be transplantable as determined by the Project Arborist: 1) tree is of a size, condition and type suitable for transplant, 2) adequate equipment access, 3) recipient planting site available, 4) seasonality and weather conditions are suitable, 5) commitment to provide on-going post-transplant care and maintenance.

Compensation Required: Trees regulated under the City of Guelph Private Tree By-law (2010-19058) destroyed or injured are to be replaced with one or more replacement trees. Other requirements and alternatives may apply as per the By-law. Trees are to be compensated for at a 3:1 ratio. No compensation is required for a tree less than 10 cm DBH; invasive species of Common Buckthorn, Glossy Buckthorn, Black Alder, Autumn Olive or White Mulberry; trees infected by a lethal pathogen, fungus or insect (including Emerald Ash Borer, Asian Long-horned Beetle); hazardous trees; trees 70% or more dead.

Y (Yes) - Compensation is required for removed regulated tree.

N (No) - Compensation is not required for removed regulated tree.

APPENDIX 13. TREE INVENTORY AND ASSESSMENT DEFINITIONS

Note: Not all definitions may apply.

Codes of Damage Descriptions

BA - branch attachment poor
BB - burlap, basket, wire present on/in tree/root ball
BC - bark crack
BD - bark dead
BI - bark included
BS - basal trunk sprouts
CB - crown broken
CD - crown dieback
CK - canker (abnormal growth from disease or damage)
CL - crown live, CL20 - 20% live crown
CS - crown sprouts
CT - crown thin (having reduced foliage)
CU - crown unbalanced
CV - crown vines
DW - deadwood
EAB(C) - Emerald Ash Borer confirmed
EAB(S) - Emerald Ash Borer symptom
FK - forked stems (e.g. FK3at2m)
FB - fungal bodies present
II - insect infestation
LC - leaves chlorotic (yellow)
LD - leaves defoliated
LH - limb heavy
LP - leader poor/problem
LW - leaf wilt
MB - multi-branched node of limbs on stem
ML - multiple leaders
PH - planted high
PL - planted low
PP - past pruning
RC - root crown damage/abnormality
RE - roots exposed
RG - roots girdling
SC - stems co-dominant
SG - stem girdled
ST - soil on trunk
SV - stem vigour reduced
TB - trunk bent
TC - trunk cavity
TK - trunk crooked
TD - trunk decay
TE - trunk base enlarged abnormally
TF - trunk basal flare lacking / abnormal
TG - trunk/stem girdling
TK - trunk / main stem(s)
TL - trunk lean ($L < 5^\circ$), ($M 5-20^\circ$), ($H > 20^\circ$)
TM - trunks multiple from at or below ground level
TS - trunk split
TT - trunk twisted
TW - trunk wound
WW - wet wood

QUANTIFIED CONDITIONS (defects, diseases)

L (low, minor), M (moderate), H (high, severe)
e.g. CT(H) = severe crooked trunk
TD(L) = minor trunk decay
TF(H) = severely poor basal trunk flare
Cu

CARDINAL COORDINATES (N, S, E, W)

e.g., TL L S = minor lean to the south
CU M NE = mod. crown unbalanced to northeast

Codes of Recommendations

A - Add mulch
B - Remove attachments (burlap, wire, stake, guard)
C - Cable; F - Fertilize; L - lower soil level
M - Monitor
N - None Needed
P - Prune; R - Remove
S - Soil bulk density (compaction) lower
V - soil volume (increase); W - Water
~ - Denotes approximate
Cor Prune - corrective prune (structure, deadwood, etc.)

Age Class

The age of the tree is estimated based on tree species, size DBH, condition and location, and subdivided into one of the following age classes.

- 1 - Less than 10 years (<10cm DBH)
- 2 - 10 to 20 years (10-20cm DBH)
- 3 - 21 to 50 years (21-30cm DBH)
- 4 - 51 to 100 years (31-50cm DBH)
- 5 - 101 to 150 years (51-80cm DBH)
- 6 - >150 years (>80cm DBH)

Note: DBH is used as a guideline only and generally applies to large stature tree types (e.g. Oaks), growing under preferred conditions. Other factors that are considered in assigning an age class are tree type, cultural conditions, and location.

A 50mm caliper tree (approx. 4cm DBH) requires about 8 years to produce.*

* OMAFRA:

http://www.omafra.gov.on.ca/english/crops/facts/info_newgrower.htm

Life Span Class

The expected time in years remaining for the tree before it experiences significant decline under existing conditions and without intervention from arboricultural treatments. Life expectancy is based on tree species, size, condition, location and tree age, and subdivided into one of the following time classes.

- 1 - Less than 5 years
- 2 - 5 to 10 years
- 3 - 11 to 20 years
- 4 - 21 to 50 years
- 5 - 51 to 100 years
- 6 - 101 to 200 years

Priority: An action priority schedule (i.e. general timing) to provide arboricultural treatment(s).

- E - Extremely Urgent (within a week)
U - Urgent (within 3 months)
H - High (within a year)
M - Moderate (within 3 years)
L - Low (little or no action required for at least 5 years)

Defect Class:

Abiotic - Primary defects having an abiotic cause, e.g. soil, water and nutrition.
Biotic - Primary defects having a biotic cause, e.g. insect, disease, weeds.
Structural - Primary defect having a structural cause, e.g. stem lean, multiple stems, split trunk.
NA - no defect or no defect to classify.

- Urban Forestry
- Ecological Restoration
- Landscape Architecture
- Environmental Studies
- Expert Opinion

ABOUD & ASSOCIATES INC.
Consulting Arborists • Ecologists • Landscape Designers



591 Woolwich Street . Guelph . Ontario . N1H 3Y5 . T:519.822.6839 . F:519.822.4052 . info@aboudtng.com . www.aboudtng.com