

Guelph Pedestrian Bridges

Norwich Bridge

City of Guelph, Ontario

Scoped Environmental Impact Study

Prepared for:
The City of Guelph

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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 (MNR 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 (MNR), 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, OMNR 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 (MNR) 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 (Dougan & 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 (Dougan & 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 petiolate</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.

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.

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.

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		
		<ul style="list-style-type: none"> Changes to drainage Changes to surface runoff 	ST	R	SA	O	PD	M	Y	Moderate	<ul style="list-style-type: none"> Minimize changes to land contours and natural drainage Maintain streams and timing, quantity of flows 	Minor-None	
		<ul style="list-style-type: none"> Changes in soil moisture, vegetation 	ST	R	SA	O	PD	L	N	Minor	<ul style="list-style-type: none"> Minimize the area and duration of soil exposure 	None	
		<ul style="list-style-type: none"> Disturbance to wildlife 	ST	R	SA	O	PD	L	N	Minor	<ul style="list-style-type: none"> Conduct work outside timing windows of sensitive species or periods 	Minor-None	
		<ul style="list-style-type: none"> Wildlife Entering Construction Areas 	ST	R	SA	O	PD	L	N	Minor	<ul style="list-style-type: none"> Implementation of ESC fence to minimize wildlife wandering 	Minor-None	
Construction	Bridge Construction	<ul style="list-style-type: none"> Increased erosion, sedimentation, and turbidity 	ST	R	SA	S	PD	H	Y	Minor	<ul style="list-style-type: none"> Maintain vegetated buffers Develop sediment and erosion control plan Maintain or provide vegetative buffers 	None	<ul style="list-style-type: none"> Monitor for successful establishment of native plant communities.
		<ul style="list-style-type: none"> Water contamination by oils, gasoline, grease, and other materials 	ST	R	SA	S	PD	H	Y	Moderate	<ul style="list-style-type: none"> 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	
		<ul style="list-style-type: none"> Loss of vegetation and removal of dead trees for user safety 	ST	R	SA	O	PD	M	N	Minor	<ul style="list-style-type: none"> Revegetate areas with native species Compensate for Dead Tree Loss 	None	<ul style="list-style-type: none"> Monitor for successful establishment of native plant communities.
		<ul style="list-style-type: none"> Disturbance to Wildlife from sounds and activity associated with construction. 	ST	R	SA	O	PD	L	N	Minor	<ul style="list-style-type: none"> Time activities to avoid sensitive wildlife periods 	Minor-None	
Post-Construction	Operation/Maintenance	<ul style="list-style-type: none"> Water quality impacts from de-icing procedures Pollution from regular 	LT	A	LA	S	PD	M	Y	Moderate	<ul style="list-style-type: none"> 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)	<ul style="list-style-type: none"> Increased erosion, sedimentation and turbidity to waterbodies 	LT	P	SA	C	PD	L	Y	Minor	<ul style="list-style-type: none"> Choose designs and materials that will minimize impacts Minimize erosion by using gravel, stones or wood on paths 	Minor-None		
	Recreation Activities (e.g. walking, cycling, fishing)	<ul style="list-style-type: none"> Trampling of vegetation 	LT	P	AA	M	PD	M	Y	Minor	<ul style="list-style-type: none"> 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		
		<ul style="list-style-type: none"> Disturbance to wildlife during critical life stages 	LT	P	AA	M	PD	M	Y	Moderate	<ul style="list-style-type: none"> Provide clearly marked walkway away from sensitive features and wildlife habitat 	None		
		<ul style="list-style-type: 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	<ul style="list-style-type: none"> 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).

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