APPENDIX 7

NATURAL ENVIRONMENT ASSESSMENT REPORT

Macdonell and Allan's Structures Schedule 'B' Municipal Class Environmental Assessment

Natural Environment Assessment Report

June 26, 2025

Prepared for:

CITY OF Guelph
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Macdonell and Allan's Structures Schedule 'B' Municipal Class Environmental Assessment

Natural Environment Assessment Report

Prepared for: City of Guelph

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RVA 215632

June 26, 2025

Macdonell and Allan's Structures Schedule 'B' Municipal Class Environmental Assessment
Natural Environment Assessment Report

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1.0 Introduction

R.V. Anderson Associates Limited (RVA) was retained by the City of Guelph (City) to complete a Schedule 'B' Municipal Class Environmental Assessment (Class EA) for the Macdonell Bridge Area, including the Macdonell Street corridor from the Woolwich/Wellington intersection to the Arthur Street/Rose Street intersection, the Macdonell Bridge, Allan's Bridge, and Allan's Dam Spillway & Sluiceway. This Class EA is being undertaken in support of the Downtown Infrastructure Revitalization Program. The Downtown Infrastructure Revitalization Program serves as the overall capital program for the reconstruction and improvement of public infrastructure within the road allowances in Downtown Guelph. The Infrastructure Revitalization Program will address aging municipal infrastructure throughout the Downtown Core. The planning phase of the Downtown Infrastructure Revitalization Program includes a Capital Implementation Plan and two Class EAs. This assignment includes improvements to the Macdonell and Allan's Structures (the Project).

In support of the Project, an assessment of the surrounding natural environment was undertaken. This report summarizes the results of this assessment including background review, field investigations, Species at Risk (SAR) screening, and highlights areas of sensitive or significant natural heritage value that should be considered during the Project. The report concludes with recommendations to eliminate or reduce the potential impacts of the Project on the identified natural environment components, as well as required permits and approvals, to support in the selection of the preferred solution.

1.1 Study Area

The Project is located in Guelph, Ontario, within the City's Downtown Core. The Subject Lands, which are bisected by the Speed River, extend approximately 150 metres (m) along Macdonell Street from the Woolwich/Wellington intersection to the Arthur/Rose intersection and includes the Macdonell Bridge, Allan's Bridge, and Allan's Dam Spillway & Sluiceway, as well as the municipal road allowance. The Study Area includes the Subject Lands as well as a buffer of 120 m (**Map 1**).

Macdonell and Allan Structures Environmental Assessment
City of Guelph

Natural Environment Assessment Report

Map 1: Study Area Overview

0 35 70 105 140 m

Scale: 1:2,500

Date: 2/26/2025 | Page 1

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N

Legend

- Study Area
- Subject Lands
- Location of Bridge Structure

Data Source: Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, City of Guelph

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1.2 Study Objectives

The intent of the Project is to undertake an EA study to provide the framework for the identification, systematic review and evaluation of alternatives based on the consideration of all aspects of the environment, including public and agency input. This Natural Environment Assessment Report (NEAR) has been prepared to document the natural environment considered in the evaluation of the alternative solutions of the Project.

The objectives of this NEAR include:

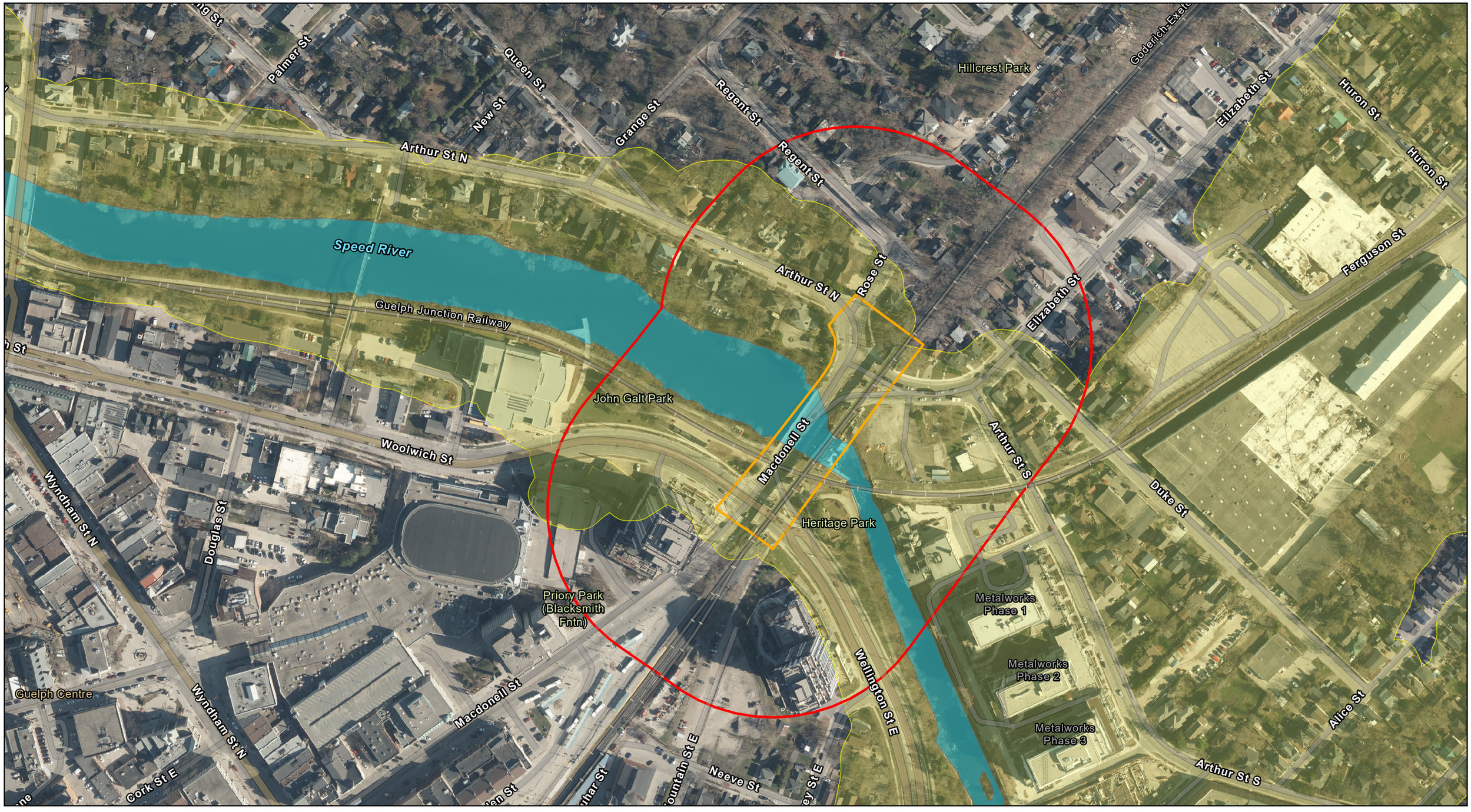
- Characterizing the existing natural heritage features within the Study Area through field investigations and consultation with agencies;
- Evaluating the significance of the identified natural heritage features and functions;
- Identifying potential constraints and opportunities applicable to the Project;
- Assessing the potential impacts of the alternative solutions on the identified natural heritage features and functions;
- Determining avoidance and/or mitigation measures to minimize the impacts on identified natural heritage features and functions to comply with relevant legislation (including the City policy);
- Identifying necessary permits and approvals; and
- Recommending enhancement options where possible.

2.0 Background Review

A desktop review was completed to identify natural environment components that are found within and adjacent to the Study Area (Map 2).

2.1 Background Review Sources

The preliminary background review included an examination of the following publicly available information related to natural environment components within the Study Area. Materials reviewed included public databases, reports, and agency consultation. Data sources reviewed are summarized in Table 2.1. Additionally, correspondence was initiated with the Ministry of Natural Resources (MNR; formerly Ministry of Natural Resources and Forestry (MNRF)), Ministry of Environment, Conservation and Parks (MECP), and Grand River Conservation Authority (GRCA) to solicit additional natural heritage information from their records (Appendix A).



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Map 2: Natural Heritage Overview

0 35 70 105 140 m

Scale: 1:2,500

Date: 2/26/2025 | Page 1

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N

Legend

- Study Area
- Subject Lands
- GRCA Regulation Limit
- Watercourse
- Waterbody

Data Source: Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, City of Guelph, Ontario GeoHub, Grand River Conservation Authority (GRCA)

Table 2.1 – Summary of Background Information Sources Reviewed

Source	Data
Additional Studies	• Natural Environment Existing Conditions Memo (R.V. Anderson Associates Ltd 2021)
City of Guelph	• The City of Guelph Official Plan (consolidated 2024)
Ministry of Environment, Conservation, and Parks (MECP)	• Information Request Letter
Ministry of Natural Resources (MNR)	• Natural Heritage Information Centre (NHIC) database • Make a Map: Natural Heritage Areas mapping application • Land Information Ontario (LIO) Mapping • Fish ON-Line Mapping application • GeoHub – Aquatic Resources Data and Wildlife Values Area
Grand River Conservation Authority (GRCA)	• GRCA Web-GIS Application • Information Request Letter
Fisheries and Oceans Canada (DFO)	• Aquatic SAR Mapping (2025)
Ontario Ministry of Agriculture, Food and Agribusiness (OMAFA)	• AgMaps
Other Publicly Available Data	• Ontario Breeding Bird Atlas (Birds Canada 2024) • Ontario Nature – Ontario Reptile and Amphibian Atlas (ORAA, Ontario Nature 2021) • iNaturalist (screened to include Research Grade and Threatened species) • Ontario Moth Atlas (Kaposi *et al.* 2023) • Ontario Butterfly Atlas (Macnaughton *et al.* 2024) • Ontario Freshwater Fishes Life History Database, Robert J. Eakins (1999-2024)

Note:
Background sources were reviewed during report preparation to confirm previous findings are up to date.

2.2 Select Legislative Review

Based on the location and nature of the Project, there are several applicable federal, provincial, and municipal environmental acts and regulations in place to protect components of the biotic environment. The governing policy framework section discusses relevant legislation and policies that are applicable to the proposed works within the Study Area.

2.2.1 Federal Legislation

Fisheries Act

The *Fisheries Act* (Government of Canada 1985) is administered by Fisheries and Oceans Canada (DFO) and provides a framework for the proper management and control of fisheries as well as the conservation and protection of fish and fish habitat, including the prevention of pollution. Section 34.4 of the *Fisheries Act* prohibits any work, undertaking or activity (other than fishing) that results in the death of fish; Section 35.1 prohibits the harmful alteration, disruption, or destruction of fish habitat (HADD); and Section 36 prohibits the deposition of deleterious substances. The *Fisheries Act* requires that projects avoid causing death of fish or HADD of fish habitat unless authorized by DFO or a designated representative.

Migratory Birds Convention Act

The *Migratory Birds Convention Act* (MBCA, Government of Canada 1994) is enforced through the Migratory Birds Regulations administered by Environment and Climate Change Canada. Together the MBCA and Migratory Birds Regulations serve to protect most migratory birds, their nests, and eggs anywhere they are found in Canada.

Species at Risk Act

At a federal level, SAR designations for species occurring in Canada are initiated by the completion of a comprehensive Status Report by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). If approved by the federal Minister of the Environment, species are added to the federal List of Wildlife Species at Risk (Government of Canada 2002). Species that are included on Schedule 1 as Endangered or Threatened are afforded both individual and critical habitat protection on federal lands under the *Species at Risk Act* (SARA). On private or provincially owned lands, only aquatic species listed as Endangered, Threatened or Extirpated are protected under SARA, unless ordered by the Governor in Council.

2.2.2 Provincial Legislation

Provincial Planning Statement

The Provincial Planning Statement (PPS, Ministry of Municipal Affairs and Housing (MMAH) 2024) sets the policy direction for regulating development and land use planning in the province. Both provincial and local land-use planning decisions build on the PPS and its relevant policies. This report deals specifically with the policies contained in Chapter 4, Section 4.1 (Natural Heritage) of the PPS which is directed at protection and management

of natural heritage systems and features. A natural heritage system is defined by the Province of Ontario as:

A system made up of natural heritage features and areas, and linkages intended to provide connectivity (at the regional or site level) and support natural processes which are necessary to maintain biological and geological diversity, natural functions, viable populations of indigenous species and ecosystems. These systems can include natural heritage features and areas, federal and provincial parks and conservation reserves, other natural heritage features, lands that have been restored or have the potential to be restored to a natural state, areas that support hydrologic functions and working landscapes that enable ecological functions to continue (MMAH 202).

Natural heritage features of significance are described in the Natural Heritage Reference Manual (MNR, 2010) and include:

- significant wetlands;
- significant coastal wetlands;
- other coastal wetlands in Ecoregions 5E, 6E and 7E;
- fish habitat;
- significant woodlands;
- significant valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River);
- habitat of endangered and threatened species;
- significant wildlife habitat; and
- significant areas of natural and scientific interest (ANSIs).

Development and site alteration is not permitted in:

- significant wetlands in Ecoregions 5E, 6E and 7E and significant coastal wetlands;
- significant wetlands in the Canadian Shield north of Ecoregions 5E, 6E and 7E, significant woodlands and significant valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River), significant wildlife habitat, significant ANSIs, and coastal wetlands in Ecoregions 5E, 6E and 7E that are not subject to policy 2.1.4(b), unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions; and
- fish habitat or habitat of endangered and threatened species except in accordance with provincial and federal requirements.

Endangered Species Act

On provincially regulated lands in Ontario, SAR and their habitats are protected under the *Endangered Species Act* (ESA, Government of Ontario 2007) which is administered by the Ministry of Environment, Conservation and Parks (MECP). Section 9(1) of the ESA prohibits the impacts to individuals of protected species, while Section 10(1) prohibits damaging or destroying their habitat which varies across species. The ESA does include provisions for permits under Section 17(2)(c) that would otherwise contravene the Act. Projects that propose impacts to SAR or their habitat require correspondence with MECP and may require a permit or other process (e.g., registration) to proceed without contravening the Act.

As of June 5, 2025 the ESA was amended and will eventually be repealed as a component of the *Protecting Ontario by Unleashing the Economy Act* (Bill 5, Government of Ontario 2025) and replaced with the *Species Conservation Act*. At the time of this report, the ESA is still the effective piece of legislation, though in reduced capacity, mainly in that habitat protections are reduced. For animal species, habitat protection is limited to dwellings (nest, den, etc.) or other occupied or habitually occupied place (breeding, rearing, staging, hibernation, etc.) and immediate surroundings required to support such a place. For vascular plants, the habitat is reduced to the critical root zone of an individual. For all other species, the habitat is described as "an area on which any member of a species directly depends in order to carry on its life processes: ("habitat")". The changes also permit harassment of a listed species, repeal the requirement for the existence of a recovery strategy for listed species, management plans for special concern species and related government response statements, and a host of other changes related to implementation and enforcement.

Conservation Authorities Act

The *Conservation Authorities Act* was significantly modified on April 1, 2024, with subsequent changes occurring on June 6, 2024. In the revised Act, Section 28(1) prohibits a number of activities from occurring within the jurisdiction of an authority. Generally, these are activities that interfere with watercourses, valleys, shorelines, hazardous lands, wetlands, and similar, and regulated under the new Ontario Regulation (O. Reg.) 41/24 Prohibited Activities, Exemptions and Permits.

The Study Area is located within the Grand River Conservation Authority (GRCA) watershed, and sections are regulated under O. Reg. 41/24. GRCA may grant permission to modify lands within their regulation limit under conditions outlined in a permit.

Clean Water Act

In response to the Walkerton crisis in 2000, the *Clean Water Act*, 2006, was established to protect raw municipal drinking water at its source by preventing its contamination and overuse. Source water includes untreated water taken from underground aquifers and surface water features, such as streams, rivers, and lakes, to supply municipal drinking water systems. The *Clean Water Act* legislates the development of watershed-based source protection plans that identify community driven policies and programs to manage and protect the quality and quantity of both existing and future municipal drinking water sources. Once a Source Water Protection Plan is approved by the Ministry of the Environment, Conservation and Parks (MECP), its policies are implemented by the various authorities designated by the Source Protection Plan.

Invasive Species Act

Invasive species are an emerging concern, both due to impacts to ecosystems as well as land use and infrastructure. In Ontario, the *Invasive Species Act* (ISA, Government of Ontario 2015) sets out rules to prevent and control the spread of invasive species. The ISA recognizes two classes of invasive species: prohibited and restricted. In the case of restricted invasive species, it is illegal to import, deposit, release, breed/grow, buy, sell, lease or trade restricted invasive species. Prohibited species have the same restrictions, but it is also illegal to possess or transport these species.

Fish and Wildlife Conservation Act

The *Fish and Wildlife Conservation Act* (Government of Ontario 1997) sets policies and regulations concerning the use of fish and wildlife resources in Ontario, including fishing and hunting, trapping, wildlife in captivity and the sale and purchase of wildlife and/or parts. This legislation also applies to persons handling wildlife for the purposes of salvage/relocation.

2.2.3 Municipal Legislation

City of Guelph Official Plan (February 2024 Consolidation)

Land use within the Study Area is guided mainly by the City of Guelph Official Plan (2024). As per the City's Official Plan, the Study Area is situated within the Approved Downtown Secondary Plan area (Schedule 2: Land Use Plan) and is designated as an Urban Growth Centre west of the Speed River and a Built-up Area east of the Speed River (Schedule 1a: Growth Plan Elements). Within the Study Area, the Speed River is associated with a City Natural Heritage System (Schedule 2 and Schedule 4: Natural Heritage System). Within the Study Area, this Natural Heritage System is designated as a Significant Natural Area as per Schedule 4: Natural Heritage System of the City's Official Plan and includes Fish Habitat

and Permanent and Intermittent Streams (Schedule 4B), Significant Valleylands (Schedule 4D) and Significant Wildlife Habitat (Schedule 4E).

Policy 4.1.2.4 (General Permitted Uses) states: *City infrastructure, where essential and authorized under an EA, may be permitted within the Natural Heritage System, where the EA demonstrates to the satisfaction of the City, in consultation with the GRCA, the provincial government and/or the federal government, as applicable, that:*

i) there will be no negative impacts on the natural features and areas to be protected, or their ecological and hydrological functions;
ii) works will result in a net ecological benefit to the Natural Heritage System and/or water resource system;
iii) works will be located as far away from the natural features and areas as possible;
iv) the area of construction disturbance will be kept to a minimum; and
v) disturbed areas within the area of construction will be re-vegetated or restored with site-appropriate indigenous plants wherever opportunities exist.

2.3 Summary of Background Information

Review of the information sources listed in Section 2.1 indicated that several SAR are found or are potentially found within the vicinity of the Study Area (Appendix B). The City of Guelph Official Plan (2024) also identified natural heritage features associated with the Speed River including Fish Habitat, Permanent and Intermittent Streams, Significant Valleylands along the riverbanks, and Significant Wildlife Habitat along the river channel within the Study Area.

3.0 Methodology

A desktop review was completed for the entire Study Area. Field investigations conducted to confirm desktop findings and fill information gaps focussed on the watercourse and the adjacent buffers within the Study Area.

3.1 Field Investigations

Field investigations were conducted during the 2022 summer field season as shown in Table 3.1. All incidental wildlife, habitat, and pertinent landscape data was recorded to support a thorough assessment of the area.

Table 3.1 – Field Investigations Schedule

Survey Type	Date	Weather	RVA Staff
Fish Habitat Assessment; Water Quality	August 11, 2022	Scattered clouds, 24 °C	N. Welch C. Beneteau
Vegetation Community Classification; Incidental Observations	August 11, 2022	Scattered clouds, 24 °C	P. Mikoda

The following sections provide detailed methodologies used to assess the flora and fauna during field investigations.

3.1.1 Ecological Land Classification and Vegetation Inventory

A single season floral inventory and Ecological Land Classification (ELC) community survey was completed for the Study Area. ELC was completed as per Lee *et al.* (1998). ELC communities were first classified per the Ecological Land Classification for Southern Ontario: First Approximation and Its Application (Lee *et al.* 1998) protocols.

Vegetation surveys were restricted to the Macdonell Road corridor within the Study Area and immediately adjacent areas potentially impacted by the Project. Surveys were completed by walking transects throughout the Study Area. Areas exhibiting variation in floral or topographical composition were reviewed in further detail.

3.1.2 Significant Wildlife Habitat and Incidental Terrestrial Wildlife

Significant Wildlife Habitat (SWH) was assessed based on the collection of targeted and incidental field data and comparisons to thresholds set out in the Significant Wildlife Habitat Criteria Schedule for Ecoregion 7E (OMNR 2015), a significant component of which is the ELC communities described earlier. SWH are areas or features that are rare or provide important habitat functions and are subsequently protected through the Natural Heritage section (4.1) of the Provincial Planning Statement (MMAH 2024). In many cases, to complete a full suite of evaluations for every potential SWH would be extremely arduous and time consuming, so in many cases professional opinion and experience is utilized to screen potential SWH. As this Project is infrastructure supported by the Municipal Class Environmental Assessment (EA) process, its implementation is not considered development as defined by the PPS and Section 4.1 does not apply. However, for Projects within the City of Guelph, Policy 4.1.2.4 applies to the EA process, reinstating the requirement to review and consider SWH which is defined as part of the Natural Heritage System.

During the site visit, terrestrial wildlife, including call and signs, were recorded. Specific habitats surveyed for included gravel roadsides (reptile nesting), mammal burrows (often on slopes), recently disturbed soils, potential cover objects, or other anomalous or unique features or habitat within the Study Area including large dead or decaying (wildlife) trees. Wildlife surveys were conducted in conjunction with floral surveys, described above.

Potentially Significant Wildlife Habitat (SWH) features were identified using the criteria in the Significant Wildlife Habitat Criteria Schedule for Ecoregion 6E (MNRF 2015) and the Significant Wildlife Habitat Technical Guide (MNRF 2000).

3.1.3 Fish and Aquatic Habitat

As the fish species in the Speed River are well documented, fish community sampling was outside of the scope of this study. The fish and aquatic habitat was investigated within the Study Area and involved identifying and recording:

- Habitat information/locations including stream morphology, bed substrate, bank characteristics;
- Water chemistry including temperature, dissolved oxygen, pH, and conductivity;
- "Critical" or important habitat areas including potential spawning areas, nursery cover, and feeding areas; and
- Potential constraints, mitigation measures, habitat compensation and/or enhancement opportunities.

3.2 Species at Risk (SAR) Screening

Provincially protected SAR can be found throughout Ontario in both documented and undocumented populations. A list of SAR with potential to occur in the Study Area was compiled from background sources (Appendix B) and the habitat requirements for these species were identified using online provincial summary documents, as well as assessment reports from the Committee on the Status of Species at Risk in Ontario (COSSARO) and the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

The data collected during field studies described above was compared to the known habitat preferences and general locations of SAR noted in background review documents to determine the potential that these species or their habitat could occur in the Study Area. SAR that were confirmed to be present or were determined to have a high probability of occurring in the Study Area are discussed in Section 4.5.

4.0 Existing Conditions

4.1 Designated Natural Areas

John Galt Park and Heritage Park are local parks surrounding the Macdonell Bridge crossing, along the southwest bank of the Speed River in the Study Area. No provincially designated parks, conservation areas, reserves, provincially significant wetlands (PSW), or Areas of Natural or Scientific Interest (ANSI) were identified in the Study Area. As noted in Section 2.2.3, a City of Guelph Natural Heritage System was identified in the study limits associated with the Speed River where it bisects the Study Area. This Natural Heritage System is designated as a Significant Natural Area as per Schedule 4: Natural Heritage System of the City's Official Plan and includes Fish Habitat and Permanent and Intermittent Streams (Schedule 4B), Significant Valleylands (Schedule 4D), and Significant Wildlife Habitat (Schedule 4E) (City of Guelph 2024). No additional Designated Natural Areas were noted by agencies or located during the background review.

The following sections examine the designated natural areas and features found in the Study Area.

4.1.1 Fish Habitat

The Speed River, within the Study Area, is mapped as cool water fish habitat with a 30 m minimum buffer (Schedule 4B).

4.1.2 Significant Valleylands

Within the City of Guelph, Significant Valleylands are defined based on criteria described by the City of Guelph Official Plan (City of Guelph 2024). The criteria for significance include undeveloped areas within floodplains, and ravine flooding and erosion hazards as per GRCA, and remanent, undisturbed portions of the Speed and Eramosa Rivers that reflect the natural diversity and physical characteristics of the river system. Based on the results of the background review completed for the Project, the City has identified the Valleylands within the Study Area as significant, which are associated with undeveloped portions of the regulatory floodplain present along the banks of the Speed River.

4.1.3 Significant Wildlife Habitat

Within the City of Guelph, Significant Wildlife Habitat is defined based on criteria described by the City of Guelph Official Plan (City of Guelph 2024). The criteria for significance include ecologically important habitats that contribute to the natural heritage system, such as

seasonal concentration areas, rare or specialized habitats, and habitats for species of conservation concern, as well as ecological linkages. Based on the results of the background review completed for the Project, the Speed River within the Study Area is mapped by MNR as a Waterfowl Winter Concentration Area.

4.2 Conservation Authority Regulated Areas

The Study Area is located within the GRCA regulation limit. As such, O. Reg. 41/24 (Prohibited Activities, Exemptions and Permits) under Section 28 of the *Conservation Authorities Act*, administrated by the GRCA, applies to the drainage features and floodplain within the Study Area. Under this regulation, GRCA may grant permission to modify lands within their regulation limit under conditions outlined in a permit.

4.3 Water Resource and Source Protection

The Study Area is under the jurisdiction of the Grand River Source Protection Plan. The Plan identifies where there is potential for significant threat to the quality and quantity of groundwater through delineation of Wellhead Protection Areas (WHPAs), Highly Vulnerable Aquifers (HVAs), Significant Groundwater Recharge Areas (SGRAs), and Intake Protection Zones (IPZs).

A wellhead protection area and intake protection zone 3 are mapped within the Study Area; however, highly vulnerable aquifers and significant groundwater recharge areas were not identified. Road and bridge construction is not considered a prescribed drinking water threat under O. Reg. 287/07 under the *Clean Water Act*, however construction activities should be assessed for potential adverse impacts/drinking water threats and policy applicability. Section 4.2 (Watershed Resource System and Watershed Planning) of the City's Official Plan describes water resource protection (reducing water consumption) and source protections (designed to protect existing and future sources of municipal drinking water).

There are no municipal water wells adjacent to the study area, however there are private wells. As such, it is recommended that a water well survey to obtain background information to any private wells within a 500 m area is completed prior to construction to assist the City in case of any well complaint during construction, and that a monitoring and contingency plan is implemented for any well complaint during construction.

4.4 Vegetation and Vegetation Communities

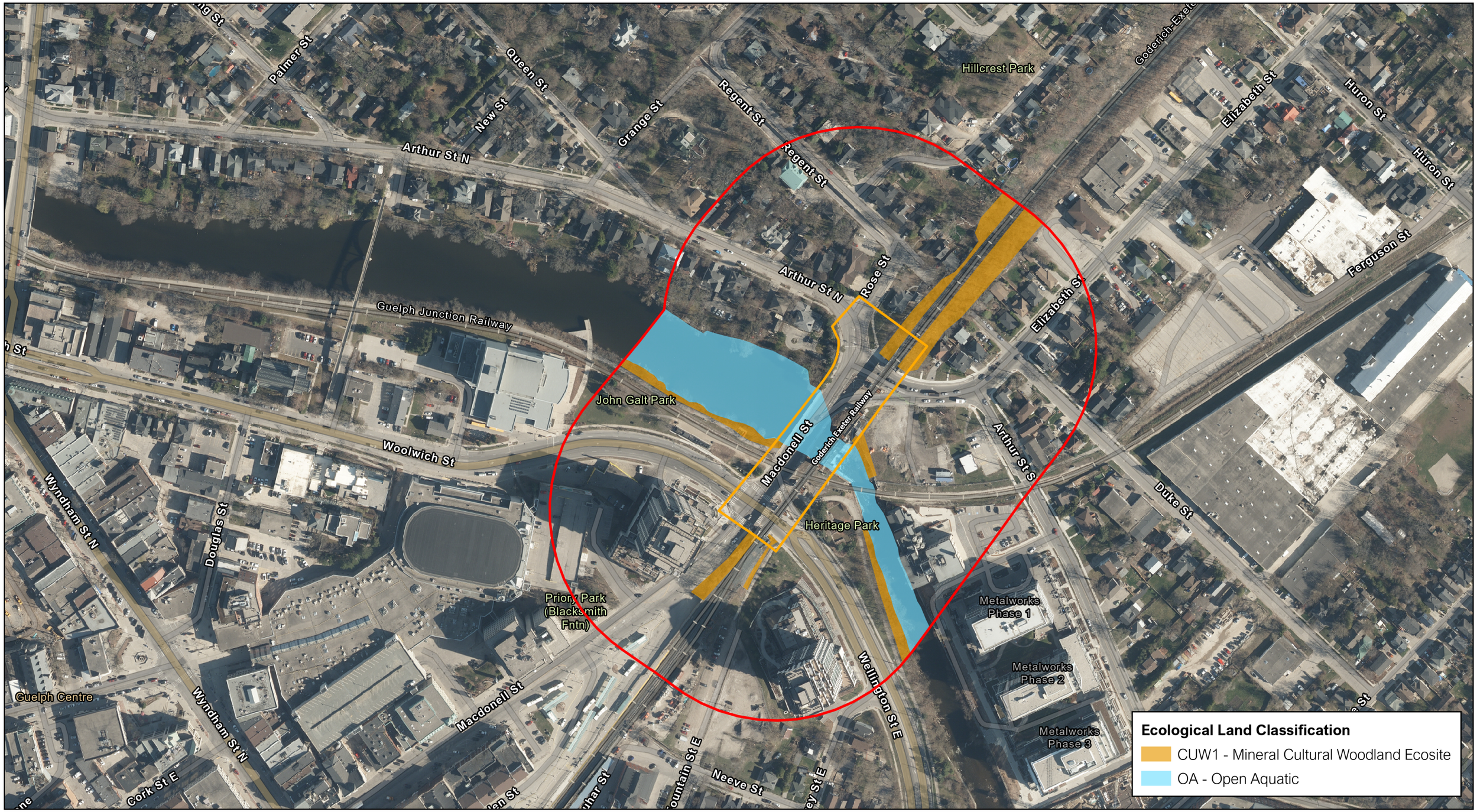
The Study Area is within an urbanized downtown setting comprised of commercial, residential, and industrial landscape. Remaining greenspace is associated with Speed River and its riparian areas, which includes John Galt Park upstream and Heritage Park downstream of the Macdonell Bridge crossing, along the southwest bank of the river. These riparian areas support natural/successional vegetation communities. The natural and successional vegetation communities identified within the Study Area are described in Table 4.1 and depicted in Map 3. The dominant vegetation reviewed within the Study Area is classified as a Mineral Cultural Woodland (CUW1) which is situated generally within the riparian areas of the Speed River and along the Goderich Exeter Railway corridor. This community has a thin canopy/subcanopy of scattered shrubs and small trees such as Black Walnut (*Juglans nigra*), Manitoba Maple (*Acer negundo*), and White Elm (*Ulmus americana*). Lower vegetation layers are typical of this community type, being formed by a dense assemblage of Orchard Grass (*Dactylis glomerata*), Virginia Creeper (*Parthenocissus quinquefolia*) and Great Ragweed (*Ambrosia trifida*). Manicured areas were also present within John Galt Park, Heritage Park, as well as residential and unmaintained areas outside of the riparian areas and parks.

Table 4.1 – Vegetation Communities within Study Area

ELC Code	ELC Vegetation Community	Description
CUW1	Mineral Cultural Woodland	Treed community with a history of anthropogenic influence. Non-native floral species are often the most dominant vegetation form. Substrates are usually mineral material (e.g., sand, gravel, cobble).

4.4.1 Flora

A floral inventory was completed on August 11, 2022, within natural/successional communities with the potential to be physically or functionally impacted by the Project within the Study Area. In total, 137 vascular floral species were identified during field investigations. The species composition of the surveyed Study Area is typical of cultural woodlands and thickets. The details of the single-season plant inventory are found in Appendix C.



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City of Guelph

Natural Environment Assessment Report

Map 3: Vegetation Communities Overview

0 35 70 105 140 m

Scale: 1:2,500

Date: 3/5/2025 | Page 1

RVA: 215632 | Draft By: KW

N

Legend

Study Area | Subject Lands

Data Source: Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, City of Guelph, Ontario GeoHub

4.5 Wildlife and Wildlife Habitat

4.5.1 Incidental and Targeted Wildlife Observations

During field investigations on August 11, 2022, all terrestrial wildlife observed, including calls and signs, were recorded. Due to the urbanizing nature of the Study Area, it is anticipated that most wildlife species in the area are able to tolerate some human disturbance and can utilize a mix of cultural and successional landscapes. Birds recorded have been assumed to be residents/breeding. Table 4.2 lists all wildlife species identified during field investigations.

Table 4.2 – Incidental Terrestrial Wildlife

Common Name	Scientific Name	ESA/ SARA	Provincial Status (S Rank) *
Birds			
American Crow	*Corvus brachyrhynchos*	-/-	S5
American Goldfinch	*Spinus tristis*	-/-	S5
Chipping Sparrow	*Spizella passerina*	-/-	S5B, S3N
Common Grackle	*Quiscalus quiscula*	-/-	S5
Double-crested Cormorant	*Nannopterum auritum*	NAR/-	S5B, S4N
Eastern Kingbird	*Tyrannus tyrannus*	-/-	S4B
European Starling	*Sturnus vulgaris*	-/-	SNA
House Finch	*Haemorhous mexicanus*	-/-	SNA
House Sparrow	*Passer domesticus*	-/-	SNA
Mourning Dove	*Zenaida macroura*	-/-	S5
Ring-billed Gull	*Larus delawarensis*	-/-	S5
Rock dove (Pigeon)	*Columba livia*	-/-	SNA
Turkey Vulture	*Cathartes aura*	-/-	S5B, S3N
Invertebrates			
Cabbage White Butterfly	*Pieris rapae*	-/-	SNA

Notes:
* S Rank: S5 – Secure, S4 – Apparently secure, S3 – Vulnerable, S2 – Imperiled, S1 – Critically imperiled, SNA – Non-native, SZN – Non-breeding migrants/vagrants

4.5.2 Significant Wildlife Habitat

Significant Wildlife Habitat (SWH) was assessed based on the collection of incidental field data and comparisons to thresholds set out in the Significant Wildlife Habitat Criteria Schedule for Ecoregion 6E (OMNR 2015) and is protected through the Provincial Planning

Statement (OMMAH 2024) as well as through City of Guelph planning policies, which include SWH as part of the Natural Heritage System (City of Guelph 2024). SWH is generally determined based on the presence of listed wildlife species, identified utilizing a specific vegetation community or habitat, with an additional qualifier which often includes a threshold of individuals utilizing the habitat, as well as the extent of available habitat or the geographic location of the habitat. If all of these values are confirmed, the habitat is considered Confirmed SWH. If only some of these values are confirmed, the habitat is considered Candidate SWH or Confirmed Non-SWH. In many cases, to complete a full suite of evaluations for every potential SWH would be extremely arduous and time consuming, so in many cases professional opinion and experience is utilized to screen potential SWH.

While no provincially rare wildlife were observed during the field investigations, the background review identified records for Snapping Turtle (*Chelydra serpentina*) within the Speed River. As the Speed River (a permanent watercourse) crosses through the Study Area, it can be assumed that there is the potential for suitable habitat for Turtle Wintering Areas based on sufficient water depth and the target species. Candidate Turtle Nesting Habitat was also identified but is unlikely to occur within the Study Area due to the hardened shoreline being difficult for nesting turtles to climb. Waterfowl over wintering Areas are also mapped by MNR to occur within the Study Area.

During the field investigation, a mammal burrow was observed in a spoils pile at 23 Elizabeth St. Additionally, the railway abutments at the Aurthur/Macdonell intersection are framed in large stones with gaps. Both features have the potential to allow reptiles access to spaces below the frost line, which is needed to support Reptile (snake) Hibernacula, however this cannot be confirmed. As reptiles require a moist environment, areas near the river may provide more suitable habitat with more reliable moisture levels, but no candidate voids were observed during surveys. Animal Movement Corridors are also limited within the Study Area due to the Macdonell Bridge and Allan's Dam Structures effectively removing the riparian travel habitat. No additional candidate or confirmed point-source areas of wildlife concentration/specialized habitats, such as colonial bird nesting habitat were observed.

Targeted surveys for snag and cavity trees (i.e., in leaf-off conditions) were not included in the scope of field investigations. However, trees along the Speed River, including healthy or dead/decaying individuals, may provide SWH for bat maternity colonies, as well as habitat for at-risk bats.

4.6 Fish and Aquatic Habitat

4.6.1 Aquatic Habitat

The Project is located in the Grand River watershed. The Grand River originates in the Dufferin Highlands and flows south to Lake Erie. Within the Study Area, an aquatic field investigation was completed for the Speed River during the summer to evaluate the connectivity and sensitivity of the habitats.

4.6.1.1 SPEED RIVER

Within the Study Area, the Speed River flows southeast under the Macdonell Bridge and Allan's Bridge structures. Two railway bridges were also observed to cross the Speed River within the downstream reach, including the Goderich Exeter Railway, located above the Allan's Bridge structure, and the Guelph Junction Railway, which crosses the river diagonally approximately 50 m downstream of the Macdonell Bridge crossing. At the Guelph Junction Rail crossing, the river narrowed and turns southwards.

Upstream of Macdonell Bridge, the river channel is wide and deep, exhibiting the typical characteristics of an impounded watercourse. Due to the width of the upstream reach, the riparian trees along the banks provide minimal shade. In this section of the Study Area, the left upstream bank is hard, while the right bank is more naturalized, serving as an access point for recreational use by nearby property owners. Schools of young of the year (YOY) fish were observed, indicating nursery/rearing habitat.

At the Macdonell Bridge crossing, the river flows over the dam into a pool area, which is bordered by retaining walls that form the channel banks. These retaining walls create shading along the channel due to the drop in elevation. Trees atop the left bank retaining wall also provide additional overhead cover. At the base of the dam, boulders and large woody debris were observed to provide instream cover, and foam was noted along the water surface downstream of the sluiceway. The Allan's Dam Structures function as a barrier to upstream fish migration within the Study Area.

Water quality parameters measured in the Speed River are presented in Table 4.3.

Table 4.3 – Water Quality in the Speed River

Parameter	Upstream	Downstream
Water Temperature (°C)	22.2	22.1
pH	8.26	8.31
Dissolved Oxygen (mg/L)	9.0	8.3

Parameter	Upstream	Downstream
Conductivity (µS/cm)	551	590
Air Temperature (°C)	24	24.0

Notes:
Water quality measures on August 11, 2022.

4.6.2 Fish Community

Fish species identified for the Speed River, within the vicinity of the Study Area, are summarized in Table 4.4, below. Review of the NHIC database and DFO aquatic SAR mapping did not indicate the presence of aquatic SAR within the vicinity of the Study Area, nor were any aquatic SAR identified through consultation with MECP.

Table 4.4 – Fish Records in Speed River

Species Name	Scientific Name	ESA/ SARA	Provincial Status S Rank	Thermal Regime*	Source
Blackside Darter	*Percina maculata*	-/-	S4	Cool	ARA
Bluntnose Minnow	*Pimephales notatus*	- /NAR	S5	Warm	GRCA
Brook Stickleback	*Culaea inconstans*	-/-	S5	Cool	GRCA
Brown Bullhead	*Ameiurus nebulosus*	-/-	S5	Warm	Fish ON-Line
Common Carp	*Cyprinus carpio*	-/-	SNA	Warm	Fish ON-Line
Common Shiner	*Luxilus cornutus*	-/-	S5	Cool	GRCA
Creek Chub	*Semotilus atromaculatus*	-/-	S5	Cool	GRCA
Eastern Blacknose Dace	*Rhinichthys atratulus*	-/-	S5	Cool	GRCA
Greenside Darter	*Etheostoma blennioides*	- /NAR	S4	Warm	GRCA
Johnny Darter	*Etheostoma nigrum*	-/-	S5	Cool	GRCA
Largemouth Bass	*Micropterus salmoides*	-/-	S5	Warm	ARA
Longnose Dace	*Rhinichthys cataractae*	-/-	S5	Cool	GRCA
Mottled Sculpin	*Cottus bairdii*	-/-	S5	Cool	GRCA
Northern Pike	*Esox lucius*	-/-	S5	Cool	Fish ON-Line
Pumpkinseed	*Lepomis gibbosus*	-/-	S5	Warm	Fish ON-Line
Rainbow Darter	*Etheostoma caeruleum*	-/-	S4	Cool	GRCA
Rock Bass	*Ambloplites rupestris*	-/-	S5	Cool	ARA; Fish ON-Line; GRCA
Smallmouth Bass	*Micropterus dolomieu*	-/-	S5	Cool	ARA; Fish ON-Line; GRCA
White Sucker	*Catostomus commersonii*	-/-	S5	Cool	Fish ON-Line; GRCA

Species Name	Scientific Name	ESA/ SARA	Provincial Status S Rank	Thermal Regime*	Source
Yellow Perch	*Perca flavescens*	-/-	S5	Cool	ARA; Fish ON-Line; GRCA

Notes:
*Thermal regime preference for fish species (Eakins 2025).

Based on the above table, the Speed River is comprised of secure, cool to warm water forage, bait, sport, and pan fish species, except for Blackside Darter (uncommon), Greenside Darter (uncommon), and Rainbow Darter (intolerant), which are provincially ranked (S-Rank) as apparently secure. In addition to these three darter species, a historical record from 1970 for Eastern Blacknose Dace was identified by the GRCA; however, this fish record predates the recent division of Blacknose Dace into two separate species. Furthermore, Ontario populations of Eastern and Western Blacknose Dace are difficult to distinguish and are often treated as a single species, therefore, this assessment will not differentiate between the eastern and western populations (Holm *et al*. 2010).

While the age of the records compiled during the background review are either unknown, or more than five years old, the Speed River has been extensively fished over the years. As such and as previously noted, a fish inventory was not undertaken.

4.6.3 Freshwater Mussels

In addition to fish, the Speed River provides habitat for a diverse freshwater mussel community. Eleven species of native freshwater mussels have been recorded in the Speed River watershed, with SAR recorded in the lower reaches closest to the Grand River. However, due to a series of dams on the river restricting fish movement and hence the movement of mussels (due to their obligatory parasitic phase where they mature on fish hosts), mussel records are not available for the reach of river in the study Area. Regardless, the potential presence of mussels should be considered during the study.

4.7 Species at Risk Summary

A variety of floral and faunal species of provincial interest have been recorded in the vicinity of the Study Area by various sources, including citizen scientists/projects and provincial databases. A full list of SAR identified in the background sources with potential to be found in the Study Area, discussion on their habitat preferences, and probability of occurrence as determined following field investigations and assessment is presented in Table 4.5.

Table 4.5 – Species of Conservation Concern and Species at Risk Assessment

Species Name and Status (ESA / SARA)	Species Records in the Study Area and Habitat Preference	Probability Assessment
Flora		
Butternut (*Juglans cinerea*) END / END	The NHIC database has a record of this species in the vicinity of the Study Area. Butternut is found throughout southern Ontario in deciduous and mixed forests often found growing along floodplains, streambanks, terraces and ravine slopes growing in neutral to calcareous soils, though it can occur in other habitats as well.	**Unlikely** – As the species can germinate in any open location, suitable habitat may be present within the Study Area however, field screening by experienced staff did not locate the species.
Birds		
Bank Swallow (*Riparia riparia*) THR / THR	Bank Swallow were recorded in the vicinity of the Study Area as part of targeted citizen science surveys. Nests are excavated in vertical faces of clay, sand, or gravel, including riverbanks, gravel pits and material stockpiles.	**Unlikely** – No suitable nesting habitat observed within the Study Area around the Speed River.
Barn Swallow (*Hirundo rustica*) SC / SC	Recorded in the vicinity of the Study Area as part of targeted citizen science surveys. Barn Swallow are still relatively common and build their cup-shaped mud nests almost exclusively on human-made structures like open barns, under bridges, and in culverts.	**Unlikely** – Potentially suitable nesting habitat for this species is present within the Study Area around the Macdonell and Allan Structures, but no nests or individuals were observed during the site survey, despite review of the bridge underside.
Bobolink (*Dolichonyx oryzivorus*) THR / THR	Recorded in the vicinity of the Study Area by NHIC and as part of targeted citizen science surveys. Historically Bobolink were found in tallgrass prairie and other open meadows; however, the species now breeds in hayfields.	**Unlikely** – Suitable nesting habitat was not identified within the Study Area by desktop review and this was confirmed during field review.
Chimney Swift (*Chaetura pelagica*) THR / THR	Recorded in the vicinity of the Study Area by NHIC and as part of targeted citizen science surveys. Chimney Swifts nested in caves and hollow trees prior to European settlement and are today most often associated with chimneys and other manmade structures.	**Unlikely** – Species may forage in the Study Area but suitable nesting habitat (uncapped chimneys, large hollow trees, etc) were not observed.
Eastern Meadowlark (*Sturnella magna*) THR / THR	Recorded in the vicinity of the Study Area by NHIC and as part of targeted citizen science surveys. Eastern Meadowlark breeds primarily in moderately tall grasslands, such as pastures and hayfields, but are also found in other open areas.	**Unlikely** – Suitable nesting habitat was not identified within the Study Area by desktop review and this

Species Name and Status (ESA / SARA)	Species Records in the Study Area and Habitat Preference	Probability Assessment
		was confirmed during field review.
Eastern Wood-pewee (*Contopus virens*) SC / SC	Recorded in the vicinity of the Study Area by NHIC. Eastern Wood-Pewee prefers mid-canopy layer of forest clearings and edges of deciduous and mixed forests and can often be found in parks or other modified habitats.	**Unlikely** – Suitable nesting habitat was not identified within the Study Area by desktop review and this was confirmed during field review.
Grasshopper Sparrow (*Ammodramus savannarum*) SC / SC	Recorded in the vicinity of the Study Area by NHIC. Grasshopper Sparrow prefers sparsely vegetated areas and can be found in open grasslands, hay fields, and pastures with well-drained, sandy soil.	**Unlikely** – Suitable nesting habitat was not identified within the Study Area by desktop review and this was confirmed during field review.
Least Bittern (*Ixobrychus exilis*) THR / THR	Recorded in the vicinity of the Study Area as part of targeted citizen science surveys. Least Bittern are known to inhabit wetlands including deep marshes, swamps, as well as the marshy borders of lakes, ponds, and streams, and nest in cattails.	**Unlikely** – Suitable habitat for this species is not present within the Study Area and this was confirmed by field review.
Red-headed Woodpecker (*Melanerpes erythrocephalus*) END / END	Recorded in the vicinity of the Study Area as part of targeted citizen science surveys. Red-headed Woodpecker are cavity nesters known to inhabit open woodlands and woodland edges, as well as fields with large trees scattered through out, including parklands and suburban areas, and prefer dead trees for nesting and perching.	**Unlikely** – Though the species tolerates urban habitats the Study Area is likely too urban for this species with limited available foraging habitats.
Wood Thrush (*Hylocichla mustelina*) SC / THR	Recorded in the vicinity of the Study Area by NHIC and as part of targeted citizen science surveys. Wood Thrush live in moist, mature deciduous and mixed forests with well-developed undergrowth and tall trees for singing perches. They prefer larger forests but will also use smaller woodlots.	**Unlikely** – Suitable nesting habitat not identified within the Study Area by desktop review and this was confirmed during field review.
Reptiles		
Blanding's Turtle (*Emydoidea blandingii*) THR / END	This species was recorded in the vicinity of the Study Area by citizen scientists. Blanding's Turtles live in shallow water, typically associated with wetlands, ponds and lakes, often with abundant aquatic vegetation. These turtles also	**Unlikely** – Aquatic habitat suitable for movement is present within the Study Area (Speed River), however well-vegetated

Species Name and Status (ESA / SARA)	Species Records in the Study Area and Habitat Preference	Probability Assessment
	utilize terrestrial habitats for movement, foraging and nesting.	aquatic habitat typically used by the species is not present.
Eastern Milksnake (*Lampropeltis Triangulum*) - / SC	Recorded in the vicinity of the Study Area by NHIC and as part of targeted citizen science surveys. Eastern Milksnake uses a wide variety of habitats, including fields and forests and wetlands.	**Unlikely** – There are no recent records of this species in the area and they are not typically associated with urban landscapes.
Eastern Ribbonsnake (*Thamnophis sauritus*) SC / SC	This species was recorded in the vicinity of the Study Area by citizen scientists last in 1985 (ORAA Square 17NJ62). Eastern Ribbonsnake can be found close to water where it hunts amphibians in shallow water.	**Unlikely** – This species is typically found in association with vegetated shorelines and amphibian prey, both of which are limited within the Study Area.
Midland Painted Turtle (*Chrysemys picta marginata*) - / SC	Recorded in the vicinity of the Study Area by NHIC and as part of targeted citizen science surveys. Midland Painted Turtles can utilize any available permanent aquatic habitat, including lakes, rivers, and wetlands, also stormwater ponds and sewage lagoons.	**Potential** – Suitable habitat is present within the Study Area, and though surveys completed in 2022 did not locate this species, this species has the potential to be present in the Study Area within the Speed River.
Northern Map Turtle (*Graptemys geographica*) SC / SC	Recorded in the vicinity of the Study Area by NHIC and as part of targeted citizen science surveys. Typical habitat includes lakes and rivers of sufficient quality to support molluscs, a large part of the females' diet.	**Potential** – Suitable habitat is present within the Study Area, and though surveys completed in 2022 did not locate this species, this species has the potential to be present in the Study Area within the Speed River.
Snapping Turtle (*Chelydra serpentina*) SC / SC	Recorded in the vicinity of the Study Area by NHIC and as part of targeted citizen science surveys. Snapping turtles can utilize any available permanent aquatic habitat, including lakes, rivers, and wetlands, also stormwater ponds and sewage lagoons.	**Confirmed** – Suitable habitat is present within the Study Area, and though surveys completed in 2022 did not locate this species, this cryptic species is expected to be present in the Study Area within the

Species Name and Status (ESA / SARA)	Species Records in the Study Area and Habitat Preference	Probability Assessment
		Speed River. Citizen scientists have multiple confirmed records within the Study Area.
Invertebrates		
Gypsy Cuckoo Bumble Bee (*Bombus bohemicus*) END / END	The NHIC database has a record of this species in the vicinity of the Study Area. Gypsy Cuckoo Bumble Bee inhabit open meadows, agricultural, and urban habitats, as well as boreal forest and woodlands.	**Unlikely** – Suitable habitat may be present within the Study Area. No recent citizen science or focused research (Parks Canada) records in the province.
Monarch (*Danaus plexippus*) SC / SC	This species was recorded in the vicinity of the Study Area by citizen scientists. Monarchs require milkweed plants for larva to feed on, while adults forage on the nectar of available wildflowers.	**Potential** – Suitable habitat may be present within the Study Area. Species was not observed during survyes in 2022.
Rusty-patched Bumble Bee (*Bombus affinis*) END / END	The NHIC database has a record of this species in the vicinity of the Study Area. Rusty-patched Bumble Bee inhabit open habitats including mixed farmland, savannah, sand dune, urban and lightly wooded areas.	**Unlikely** – Suitable habitat may be present within the Study Area. No recent citizen science or focused research (Parks Canada) records in the province.
West Virginia White (*Pieris virginiensis*) SC / -	This species was recorded in the vicinity of the Study Area by citizen scientists. West Virginia White inhabit moist, deciduous woodlots.	**Unlikely** – This species was last formally recorded in the area in 1993. Neither the species nor its habitat was observed in 2022 surveys.
Mammals		
SAR Bats Eastern small-footed myotis (*Myotis leibii)* *END / -* Little Brown Myotis (*Myotis lucifugus*) Northern Long-eared Myotis (*Myotis septentrionalis*)	Bats are difficult to survey for without specialized equipment. Recent changes to listed bat species mean that all bats present within Ontario other than Big Brown Bat (*Eptesicus fuscus*) are considered at-risk. Outside of known hibernacula, SARbats are associated with trees, including healthy, dead and dying trees that provide maternity roost habitat, as well as in some cases attics and other buildings.	**Potential –** Treed habitats with the potential to support SAR bats are present in the Study Area, within the CUW1 communities and parkland areas.

Species Name and Status (ESA / SARA)	Species Records in the Study Area and Habitat Preference	Probability Assessment
Tri-coloured Bat (*Perimyotis subflavus*) Hoary Bat (*Lasiurus cinereus*) Eastern Red Bat (*Lasiurus borealis*) Silver-haired Bat (*Lasionycteris noctivagans*) END/END		

4.8 Natural Heritage and Significant Habitat Summary

4.8.1 Confirmed Wildlife Habitat within the Study Area

Following background review and site investigations, habitat for two provincially rare species (Snapping Turtle and Northern Map Turtle) was determined to be present within the Study Area. Consequently, this habitat is at minimum Candidate Habitat for Special Concern and Rare Species. Although field investigations were out of season, it is likely that this habitat supports Snapping Turtle and Northern Map Turtle, and it should be considered Confirmed Habitat for Rare and Special Concern Species.

4.8.2 Candidate Wildlife Habitat within the Study Area

Candidate significant wildlife habitats with potential to occur within the Study Area (i.e., were not confirmed, but could not be ruled out following field investigations) consist of:

- Waterfowl Over Wintering Areas;
- Turtle Overwintering Areas;
- Reptile (snake) hibernacula; and,
- Candidate SAR Bat maternity roosting habitat (treed communities).

5.0 Summary of Project

The purpose of the Project is to select the preferred solution for improvements to the Macdonell Bridge Area. A long list of alternatives for each structure was considered for the Macdonell and Allan's structures and evaluated against a set of previously defined criteria. Preliminary recommendations for the short list of alternative solutions to be further considered were developed. The following sections identify the shortlisted options considered for each structure, including the recently added Ward to Downtown Pedestrian Bridge. The Ward to Downtown Pedestrian Bridges Class EA was undertaken by others in 2017 and included a Scoped Environmental Impact Study (EIS; Aboud & Associates Inc. 2017).

5.1 Alternative Solutions

The natural environment evaluation of the alternative solutions proposed for each of the structures associated with this assignment (as described in Section 1.2), as well as the proposed Ward to Downtown Pedestrian Bridge (summarized from the Scoped EIS by Aboud & Associates Inc., 2017), are presented in the following sections. These tables were part of the overall planning alternatives evaluation for the Project which took into account the other criteria, such as constructability, cost, etc., which was prepared for this EA. The recommended preferred solutions from the overall evaluation are identified in each table (and as you will note, don't necessarily align with the preferred solution based solely on natural environment aspects).

5.1.1 Macdonell Bridge

EVALUATION CRITERIA	1. Do Nothing		2. Rehabilitate Bridge		3. Rehabilitate + Widen Bridge to Accommodate AT on Both Sides		4. Replace Bridge for Vehicular Traffic Only		5. Replace + Widen Bridge to Accommodate AT on North Side	
NATURAL ENVIRONMENT & CLIMATE CHANGE	●	No anticipated impacts on the terrestrial or aquatic environment.	◕	Some minor and/or temporary anticipated impacts on the aquatic habitat and terrestrial environment.	◕	Some minor and/or temporary anticipated impacts on the aquatic habitat and terrestrial environment.	◕	Some minor and/or temporary anticipated impacts on the aquatic habitat and terrestrial environment.	◕	Some minor and/or temporary anticipated impacts on the aquatic habitat and terrestrial environment.

EVALUATION CRITERIA	1. Do Nothing		2. Rehabilitate Bridge		3. Rehabilitate + Widen Bridge to Accommodate AT on Both Sides		4. Replace Bridge for Vehicular Traffic Only		5. Replace + Widen Bridge to Accommodate AT on North Side	
Conformance with City's Environmental Policies	1	Do nothing does not create any new impacts but does not support City of Guelph Official Plan policies for growth and downtown connectivity.	3	Generally conforms with the Guelph OP by improving connectivity to the downtown core.	3	Generally conforms with the Guelph OP by improving connectivity to the downtown core.	3	Generally conforms with the Guelph OP by improving connectivity to the downtown core once bridge is replaced.	3	Generally conforms with the Guelph OP by improving connectivity to the downtown core once bridge is replaced.
Terrestrial Wildlife and Habitat	4	No anticipated impacts on the terrestrial environment.	4	No anticipated impacts on the terrestrial environment.	3	Some minor anticipated impacts on the terrestrial environment from replacement and removal of old bridge materials and vegetation from widening of bridge deck.	3	Some minor anticipated impacts on the terrestrial environment from replacement and removal of old bridge materials.	3	Some minor anticipated impacts on the terrestrial environment from replacement and removal of old bridge materials and vegetation from widening of bridge.
Aquatic Species and Habitat	4	No impacts to aquatic species and habitat.	3	Minor temporary impacts to aquatic species and habitat associated with construction during rehab.	2	Temporary impacts to aquatic species and habitat anticipated due to in-water works.	2	Temporary impacts on the aquatic species and habitat from the replacement and removal of old bridge materials and in-water works. Depending on footprint of new bridge, permanent habitat impacts are possible.	1	Temporary impacts on the aquatic species and habitat from the replacement and removal of old bridge materials and in-water works. Depending on footprint of new bridge, permanent habitat impacts are possible.

EVALUATION CRITERIA	1. Do Nothing		2. Rehabilitate Bridge		3. Rehabilitate + Widen Bridge to Accommodate AT on Both Sides		4. Replace Bridge for Vehicular Traffic Only		5. Replace + Widen Bridge to Accommodate AT on North Side	
Air Quality	4	No impacts or changes to existing air quality.	2	No impacts or changes to existing air quality. Congestion from lane reductions associated with rehabilitation may increase idling.	2	No impacts or changes to existing air quality. Congestion from lane reductions associated with rehabilitation / replacement may increase idling.	2	No impacts or changes to existing air quality. Temporary Congestion from lane reductions associated with replacement may increase idling.	2	No impacts or changes to existing air quality. Congestion from lane reductions associated with rehabilitation may increase idling.
Climate Change (Mitigation and Resilience)	4	No mitigation or resilience to climate change impacts	3	Slight increase in CO2 embodied carbon in new concrete used in rehabilitation.	2	Increase in CO2 embodied carbon in new widened sections of concrete bridge.	2	Increase in CO2 embodied carbon in new concrete bridge.	2	Increase in CO2 embodied carbon in new concrete bridge.
Form and Function of River	4	No impacts to the form and function of the river.	4	No impacts to the form and function of the river.	4	No impacts to the form and function of the river.	4	No impacts to the form and function of the river.	4	No impacts to the form and function of the river.
OVERALL EVALUATION SUMMARY	**Not Recommended**		**Not Recommended**		**Not Recommended**		**Not Recommended**		**Recommended to be Carried Forward**	

5.1.2 Allan's Bridge

EVALUATION CRITERIA	1. Do Nothing		2. Minor Rehabilitation of Bridge for Heritage Purposes Only		3.Rehabilitate Bridge for Pedestrians & Cyclists		4. Remove Bridge	
NATURAL ENVIRONMENT & CLIMATE CHANGE	◑	No anticipated impacts on the natural environment. No changes.	◑	No anticipated impacts on the natural environment. No changes.	◕	No anticipated impacts on the natural environment.	◕	Some minor anticipated impacts from bridge removal. Reduces overall footprint within Speed River.
Conformance with City's Environmental Policies	0	Does not support City of Guelph Official Plan policies for growth and downtown core connectivity.	0	Does not conform with the Guelph OP as closure to AT facilities eliminates connectivity to the downtown core through this existing path.	4	Generally conforms with the Guelph OP by improving connectivity to the downtown core.	4	Reduces overall Environmental footprint within Speed River corridor.
Terrestrial Wildlife and Habitat	3	No anticipated impacts on terrestrial wildlife and habitat.	3	No anticipated impacts on terrestrial wildlife and habitat. Any unforeseen impacts to be mitigated.	3	No anticipated impacts on terrestrial wildlife and habitat. Any unforeseen impacts to be mitigated.	2	Temporary minor impacts to adjacent terrestrial wildlife habitat can be mitigated.
Aquatic Species and Habitat	3	No impacts to aquatic species and habitat.	2	Minor temporary impacts to aquatic habitat to be mitigated.	2	Minor temporary impacts to aquatic habitat to be mitigated.	2	Moderate temporary impacts to aquatic habitat to be mitigated.
Air Quality	3	No impacts or changes to existing air quality.	2	Temporary impacts to air quality during construction associated with machines.	2	Temporary impacts to air quality during construction associated with machines.	2	Temporary impacts to air quality during construction associated with machines and concrete demolition.

EVALUATION CRITERIA	1. Do Nothing		2. Minor Rehabilitation of Bridge for Heritage Purposes Only		3.Rehabilitate Bridge for Pedestrians & Cyclists		4. Remove Bridge	
Climate Change (Mitigation and Resilience)	3	No mitigation or resilience to climate change impacts.	3	No mitigation or resilience to climate change impacts.	3	No mitigation or resilience to climate change impacts.	3	No mitigation or resilience to climate change impacts.
OVERALL EVALUATION SUMMARY	**Not Recommended**		**Not Recommended**		**Not Recommended**		**Recommended to be Carried Forward**	

5.1.3 Allan's Dam Spillway and Sluiceway

EVALUATION CRITERIA	1. Do Nothing		2.Rehabilitate Sluiceway and Spillway		3. Remove Sluiceway and Spillway		4. Remove Sluiceway and Spillway and Build a New Dam Upstream with an Active Transportation Underpass	
NATURAL ENVIRONMENT & CLIMATE CHANGE	◑	No anticipated impacts on the natural environment. Fails to mitigate future impacts associated with climate change. Maintains the existing fish barrier and eliminates the opportunity for NHS restoration.	◕	Anticipated impacts on the aquatic environment from rehabilitation of the sluiceway and spillway are minor and temporary. Maintains the existing fish barrier and eliminates the opportunity for NHS restoration.	◕	Removal will have significant impact the aquatic and terrestrial environments - transitioning from impounded pool to flowing river. Provides opportunity for restoring NHS and significant valleylands.	◔	Impacts to the aquatic environment anticipated from removal of the sluiceway and spillway. Additional impacts when the new dam is built, provides no environmental benefit. Does not conform with City's OP policy to remove barriers and refrain from impacting them further.

EVALUATION CRITERIA	1. Do Nothing		2.Rehabilitate Sluiceway and Spillway		3. Remove Sluiceway and Spillway		4. Remove Sluiceway and Spillway and Build a New Dam Upstream with an Active Transportation Underpass	
Conformance with City's Environmental Policies	1	Do nothing does not create new immediate impacts but does not support City of Guelph Official Plan policies for growth and downtown core connectivity, and climate change resilience and adaptation.	2	Rehabilitation option has minor impacts associated with the proposed works. Generally conforms with the Guelph OP by reducing impacts on Natural Areas (Significant Valleylands and areas of SWH), but does not provide any opportunities for restoration.	3	Fully removing the sluiceway and spillway will impact the aquatic and terrestrial environments. Generally conforms with the Guelph OP by removing structural barriers to fish passage, restoring the NHS, restoring/naturalizing the significant valleylands. Reduces downstream flood control capability.	0	Replacing the sluiceway and spillway with a new dam does not conform with the Guelph OP policy. Replacing a fish barrier and fragmenting the NHS is not supported.
Terrestrial Wildlife and Habitat	4	No anticipated impacts on terrestrial wildlife and habitat.	4	No anticipated impacts on terrestrial wildlife and habitat.	3	Reduction of waterfowl winter concentration area in both wetted width and depth. Probable reduction in winter waterfowl foraging quality. Potential creation of turtle nesting habitat via exposed shorelines. Migration corridor connectivity restoration. Increase in littoral zone and wetland plants. Potential for colonization of exposed shorelines by invasive species (e.g. Phragmites Reed).	2	Potential for some restoration in new terrestrial habitat created by moving the dam upstream. Potential loss of terrestrial habitat upstream as a result of moving dam and water impoundment area. Potential increase in human-wildlife conflict.
Natural Hazards	4	No impacts to natural hazards and no increase in risk associated with natural hazards.	4	No impacts to natural hazards and no increase in risk associated with natural hazards.	3	Increases the area of valleylands. Supports passive recreational activities in valleylands.	3	No impacts to natural hazards and no increase in risk associated with natural hazards.
Designated Natural Areas	4	No anticipated impacts to designated natural areas.	4	No anticipated impacts to designated natural areas.	3	Potential to restore natural floodplain function of the river and increase the valleyland feature area.	0	Impacts to the floodplain of the river and the valleyland feature. Construction of a new dam would be difficult to receive approvals.

EVALUATION CRITERIA	1. Do Nothing		2.Rehabilitate Sluiceway and Spillway		3. Remove Sluiceway and Spillway		4. Remove Sluiceway and Spillway and Build a New Dam Upstream with an Active Transportation Underpass	
Aquatic Species and Habitat	2	No impacts to aquatic species and habitat.	2	Minor impacts to aquatic species and habitat from rehabilitation. Impacts to be mitigated.	3	Temporary, extensive impacts to aquatic species and habitat from removal of sluiceway. Loss of lower quality impounded pool habitat. Increase in higher quality riffle/run habitat and associated aquatic species. Long term improved water quality and restored connectivity to habitats.	0	Temporary, extensive impacts to aquatic species and habitat from removal of sluiceway/spillway. Replacing dam will continue to restrict fish passage and habitat connectivity in the river.
Air Quality	2	No impacts or changes to existing air quality.	2	Temporary impacts to air quality during construction associated with machines.	2	Temporary impacts to air quality during construction associated with machines and concrete demolition.	2	Temporary impacts to air quality during construction associated with machines and concrete demolition.
Climate Change (Mitigation and Resilience)	1	No mitigation or resilience to climate change impacts. No adaptation potential.	1	Slight increase in CO2 embodied carbon in new concrete used in rehabilitation.	3	Potential to increase carbon sequestering with restoration plantings in the new terrestrial areas. Restoration of floodplain function and natural sediment transport. Provide and enhance wetland and surface water functions. Improved thermal regime by removing flow impoundment.	0	Increase in CO2 embodied carbon in new concrete dam. Maintains impounded flow, thermal regime, warming of the river.
Connectivity and Ecological Linkages	2	No changes to connectivity and ecological linkages.	2	No changes to connectivity and ecological linkages.	4	Restoration of the NHS, aquatic linkage, wildlife movement corridor.	2	No changes to connectivity and ecological linkages.

EVALUATION CRITERIA	1. Do Nothing		2.Rehabilitate Sluiceway and Spillway		3. Remove Sluiceway and Spillway		4. Remove Sluiceway and Spillway and Build a New Dam Upstream with an Active Transportation Underpass	
Form and Function of River Guelph OP	2	No impacts to the form and function of the river.	2	No impacts to the form and function of the river.	3	The river morphology will change from impounded pool habitat upstream, to flowing riffle/run/pool habitat. Sediment and nutrient transfer will be restored. Potential for natural floodplain function. Improved thermal regime by removing the flow impoundment.	0	The river morphology will change from impounded pool habitat upstream, to flowing riffle/run/pool habitat between the new dam and existing spillway. The new dam will maintain impounded water upstream. Potential alterations further upstream.
OVERALL EVALUATION SUMMARY	**Not Recommended**		**Recommended to be Carried Forward**		**Not Recommended**		**Not Recommended**	

5.1.4 Ward to Downtown Pedestrian Bridge

EVALUATION CRITERIA	1. Do Nothing		2. Construct 2023 Tendered Bridge		3. Construct a Modified Structure on South Side of GJR Rail Bridge		4. Construct a Modified Structure on North Side of GJR Rail Bridge	
NATURAL ENVIRONMENT & CLIMATE CHANGE	◕	No anticipated impacts on the natural environment. No changes.	◕	No anticipated impacts on the natural environment.	◕	No anticipated impacts on the natural environment.	◕	No anticipated impacts on the natural environment.
Conformance with City's Environmental Policies	1	Does not fully support City of Guelph Official Plan policies for growth and downtown core connectivity.	3	Generally conforms with the Guelph OP by improving connectivity to the downtown core.	3	Generally conforms with the Guelph OP by improving connectivity to the downtown core.	3	Generally conforms with the Guelph OP by improving connectivity to the downtown core.
Terrestrial Wildlife and Habitat	3	No anticipated impacts on terrestrial wildlife and habitat	3	No naturalized vegetation is anticipated to require removal.	3	No naturalized vegetation is anticipated to require removal.	3	No naturalized vegetation is anticipated to require removal.

EVALUATION CRITERIA	1. Do Nothing		2. Construct 2023 Tendered Bridge		3. Construct a Modified Structure on South Side of GJR Rail Bridge		4. Construct a Modified Structure on North Side of GJR Rail Bridge	
Aquatic Species and Habitat	3	No impacts to aquatic species and habitat	3	No impact to channel processes or fish movement potential.	3	No impact to channel processes or fish movement potential.	3	No impact to channel processes or fish movement potential.
Climate Change (Mitigation and Resilience)	3	No mitigation or resilience to climate change impacts	3	Adequate hydraulic clearance to be provided	3	Adequate hydraulic clearance to be provided	3	Adequate hydraulic clearance to be provided
Form and Function of River Guelph OP	3	No impacts to the form and function of the river.	2	Minor impact due to construction of abutments (already disturbed).	2	Minor impact due to construction of abutments (already disturbed).	2	Minor impact due to construction of abutments (already disturbed).
OVERALL EVALUATION SUMMARY	**Not Recommended**		**Not Recommended**		**Recommended to be Carried Forward**		**Not Recommended**	

5.1.5 Summary of Preferred Solutions

The recommended preferred solutions evaluated in the above tables can be summarized as:

- Macdonell Bridge – Replace Entire Structure and Widen to Accommodate Active Transportation
- Allan's Bridge – Remove Bridge
- Allan's Dam Spillway and Sluiceway – Rehabilitate Spillway & Sluiceway
- Ward to Downtown Pedestrian Bridge – Construct a Modified Bridge South Side of the Guelph Junction Railway (GJR) Bridge

For more details on the overall criteria and evaluation, please refer to the Macdonell and Allan's Structures 'B' Class EA - Evaluation of the Alternatives Solutions Technical Memorandum – Draft (RVA February 4, 2025).

5.2 Project Activities

While the proposed work associated with the preferred solutions has yet to be confirmed, in general, to complete the Project, several construction activities may be undertaken that

have potential to impact the natural environment features in the Study Area. These activities include:

- Vegetation removal;
- Earth works – excavation, filling, and grading;
- Works in or near water;
- Use of industrial equipment; and
- Potentially hazardous materials associated with industrial equipment and creation of infrastructure (hydrocarbons, concrete, etc.).

6.0 Preliminary Impact Assessment and Environmental Protection

The following sections provide a general overview of potential impacts the Project may have on the natural heritage features and suggest avoidance measures and operational constraints to mitigate and/or avoid these impacts for carrying forward into design. A detailed impact assessment will be undertaken during preliminary and/or detailed design.

6.1 Vegetation

Potential direct impacts to terrestrial vegetation as a component of construction of the Project, include the temporary stockpiling areas, and complete removal through construction and grading activities. Indirect impacts to landscaping trees along the periphery of construction areas may occur due to damage to roots, stems, and branches through interaction with construction equipment. Dust raised by construction activities may also negatively impact vegetation.

In general, the following measures are recommended to reduce impacts from vegetation removal required to support the Project:

- To prevent incidental impacts to nesting birds, (including at-risk and rare species) bat maternity colonies, and Monarch larva, clearing of vegetation should be restricted to outside of the migratory bird nesting, bat maternity, and Monarch rearing seasons. Conservatively, this sensitive period during which vegetation should not be removed occurs from April 1 through September 30.
- Compensation of lost woody vegetation should be in accordance with the City's Private Tree By-Law (2025) and GRCA guideline.

- Contractors should employ Clean Equipment Protocols to prevent movement of exotic invasive species to and throughout the Project area (Halloran *et al.* 2013).

6.2 Excavation, Grading, Filling, and Industrial Equipment

Construction of the Project may require excavation and stockpiling of soils, deposition of aggregate, pouring of concrete, grading and filling, and related construction activities. These activities create exposed soils and other materials (granular, loose asphalt) and can alter slopes and grades, that can in-turn affect drainage patterns. Consequently, there is potential for materials and/or sediment to be released into the environment or as dust to both terrestrial and aquatic environments. Dust on vegetation can reduce plant productivity through reduction in metabolic processes and both dust and concrete can adversely affect aquatic environments. Additionally, the industrial equipment used to accomplish these activities has the potential to release deleterious substances such as oil, fuel or grease that could seep into groundwater or be conveyed into nearby aquatic environments. Equipment can also incidentally compact soils, negatively affecting existing and future vegetation, and kill or injure wildlife. The following measures are recommended to reduce and/or avoid impacts to natural features from excavation and grading:

- In general, grading, vegetation clearing, and other activities that expose loose soil should be, as practical, scheduled in such a way that limits the area and length of time soils are vulnerable to erosion.
- Topsoil from natural vegetation communities should be stockpiled separately and re-used in post-construction efforts.
- Erosion of soils disturbed by excavation/construction will be mitigated by the erosion and sediment controls (ESCs) implemented during construction, such as silt fence/fibre rolls surrounding areas of exposed soils and stockpiles to slow water velocities and allow settling of suspended sediments.
- All excess materials generated by excavation will be stockpiled, handled, and disposed of in a manner that prevents entry into adjacent natural features.
- All stockpiled material will be maintained at an angle of 70 degrees or less to deter use of the material by Bank Swallows (*Riparia riparia*), a protected bird species.
- Maintain all machinery on site in a clean condition and free of fluid leaks.
- Wash, refuel and service machinery and store fuel and other materials for the machinery in such a way as to prevent any deleterious substances from entering nearby drainage features.

- Dust suppression, such as wetting down with water, will be on standby for areas that may generate dust during construction, including the active work area.
- A Spill Response and Action Plan should be prepared by the contractor in advance of work that describes actions to be taken in the event of a spill, and a spill kit containing appropriate absorbent materials will always be kept on site to be used in the event deleterious materials are released into drainage features or roadside drains.
- Design and implement ESCs to contain/isolate the construction zone, manage site drainage and prevent erosion of exposed soils and migration of sediment to adjacent drainage features during all phases of the Project.
- Concrete washout areas, as required during construction, should be clearly marked and located/managed so residue does not enter proximal drainage features.
- Preference should be made to use biodegradable ESC materials, and be specified in the contract drawings. Remove of any non-biodegradable ESC materials once site is stabilized is required.
- To avoid potential impacts to wildlife through entanglement, **all ESC measures, including erosion control blankets, fibre rolls, and sediment fence will be 'netless'**, meaning they do not contain nylon or other fine, open-weave synthetic mesh/netting components.

All ESC measures should be inspected regularly by a qualified professional and maintained to ensure they are functioning as intended throughout the construction period and until such time that disturbed areas have stabilized.

6.3 Wildlife and Wildlife Habitat

Wildlife and habitats identified during site visits were typical of natural/successional communities within urban and suburban areas of southern Ontario. Potential impacts to wildlife and their habitats during construction can occur through direct injury and habitat loss as well as indirect impacts such as avoidance of areas of active construction due to vibration and noise and light pollution, resulting in modification to established daily movement patterns. This disruption would be temporary, and it is anticipated that local wildlife is accustomed to a moderate amount of human disturbances.

Most of Canada's birds are protected under the MBCA. Vegetation clearing has the potential to impact breeding birds through disturbance of actively nesting individuals and destruction of nests, eggs and young. Additionally, dead/dying, or injured trees within the

Study Area may provide habitat for at-risk bats and their active-season maternity colonies. There is limited candidate habitat for bats, SAR or otherwise, within the Project footprint as there are only a few small individual trees.

Construction activities required to implement the Project may temporarily impact terrestrial wildlife habitats and have the potential to impact individuals. The following measures are recommended to reduce these impacts:

- To prevent incidental impacts to nesting birds (including at-risk and rare species) and bat maternity colonies, clearing of vegetation should be restricted to outside of the migratory bird nesting, bat maternity and Monarch rearing seasons. Conservatively, this sensitive period during which **vegetation will not be removed occurs from April 1 through September 30**.
- ESC (e.g., silt fencing) can be specified to provide the added function of wildlife barrier fencing as needed.
- To avoid potential impacts to wildlife through entanglement, **all ESC measures, including erosion control blankets, fibre rolls, and sediment fence will be 'netless'**, meaning they do not contain nylon or other fine, open-weave synthetic mesh/netting components.
- Education of construction staff regarding the potential of encountering wildlife, including turtles, as well as appropriate actions (i.e., allow the animal to leave on its own, contact a wildlife professional, etc.) is an effective mitigation against unintended impacts to wildlife.

6.4 Fish and Aquatic Habitat

Potential impacts to aquatic habitats and the fish communities therein can generally be identified as a change in habitat, injury to aquatic organisms as a result of construction, and indirect changes to the aquatic habitat that may occur in the long term and/or over a larger area.

The following mitigation measures shall be refined during preliminary and/or detailed design once construction activities are confirmed. It is recommended the applicable mitigation measures identified below be carried forward into design.

- In general, grading, vegetation clearing and other activities which expose loose soil should be, as practical, scheduled in such a way that limits the area and length of time soils are vulnerable to erosion.

- Any in-water work required for this Project shall be permitted between July 1 and March 14 (D. Ungar, personal communication, January 7, 2022).
- All work below the highwater mark shall be completed within an isolated work area, under dry conditions, to ensure sediment generated during construction activities is contained to the worksite. Cofferdams are to be constructed in accordance with the DFO Interim code of practice: temporary cofferdams and diversion channels, following all necessary mitigation and notification requirements.
- If the cofferdams enclose wetted areas, prior to any unwatering activities, a qualified Fisheries Specialist (with a Licence to Collect Fish for Scientific Purposes issued by the MNR prior to the work) shall relocate fish and mussels trapped within the isolated area to suitable habitat outside so the isolated work area.
- During all unwatering activities, fish screens shall be placed at the end of all pump intakes, in accordance with DFO's Interim code of practice: End-of-pipe fish protection screens for small water intakes in freshwater, to prevent the potential entrainment and/or impingement of fish and other aquatic animals during dewatering.
- Discharge from unwatering shall be treated (i.e., via settlement pond, filter bag, flowing through vegetated land, etc.) to remove suspended sediments prior to re-entering the stream. Treated water will be released back into the system in a manner that prevents erosion and sediment inputs in the receiving waterbody.
- An Aquatic Biologist should be present at critical times during construction to monitor the application and effectiveness of the environmental mitigation measures as outlined in the permits and approvals.
- Vegetation clearing impacts on the shoreline should be mitigated by ESCs (e.g., silt fence, fibre filtration tubes, etc.) in place during construction. Riparian vegetation removal should be kept to a minimum, as required for construction and access only. Vegetation scheduled for removal should have proper clearing techniques implemented to protect and retain the surrounding vegetation, where feasible.
- Excavation impacts shall be mitigated by the ESCs implemented during construction, such as timing constraints on covering exposed slopes, and silt fence/fibre filtration tubes surrounding areas of exposed soils to slow water velocities and allow settling of suspended sediments. All permanent changes to the slopes in the area as a result of excavation should be stabilized in the short term

with interim products (such as bonded fibre matrix) and long term with vegetation (grasses and other native plantings).

- All excess materials generated by excavation shall be stockpiled, handled, and disposed of in a manner that prevents entry into the adjacent waterbody or features.
- Restoration plan – upon final grading, all exposed soils should be immediately stabilized with a suitable seed and cover mix, and riparian areas should be replanted with native trees and shrubs to provide/replace stream shading.
- Should a spill occur, stop work, and contain sediment-laden water to prevent dispersal in the watercourse.
- Regularly monitor the Speed River for signs of sedimentation during all phases of the work, undertaking or activity, and taking corrective action as required.
- Maintain all machinery onsite in a clean condition and free of fluid leaks. Wash, refuel and service machinery and store fuel and other materials for the machinery in such a way as to prevent any deleterious substances from entering the water.
- Design and implement ESCs to contain/isolate the construction zone, manage site drainage and prevent erosion of exposed soils and migration of sediment to the Speed River during all phases of the project.
- Use biodegradable ESC materials as noted in the contract and drawings and remove any non-biodegradable ESC materials once site is stabilized.
- All ESC measures should be regularly inspected by a qualified professional and maintained to ensure they are functioning as intended throughout the construction period and until such time that disturbed areas have stabilized.
- To prevent any deleterious substances from entering the watercourse, operate, store, and maintain all equipment, vehicles, and associated materials at a minimum, 30 m away from the Speed River.
- Travel paths, stockpile areas and staging areas, within the vicinity of the waterbody, should be pre-planned and followed.

Mitigation measures should be updated and refined during the design phase of the project.

6.5 Species at Risk

No species/individuals protected under the ESA were observed during site investigations. Candidate habitat for SAR bats (treed vegetation communities) is present within the Study

Area and may be impacted by the Project. Though not observed during site surveys, Snapping Turtles were expected to be present within the Speed River and citizen science records corroborate this. Other turtle species could be present but have not been observed. Monarch likely occasionally occurs within the Study Area, but as there is limited forage and rearing habitat (*Asclepias* species), so these individuals would be expected to move to other more suitable habitats. Based on the urban nature of the Project location, there is a low likelihood of encountering the remainder of terrestrial SAR with the potential to occur within the Study Area, however the following recommendations will help to reduce potential impacts to terrestrial wildlife, SAR or otherwise:

- To prevent incidental impacts to nesting birds (including at-risk and rare species), and bat maternity colonies, clearing of vegetation should be restricted to outside of the migratory bird nesting and bat maternity seasons. Conservatively, this sensitive period during which vegetation will not be removed occurs from April 1 through September 30.
- Education of construction staff regarding the potential of encountering wildlife, including turtles, as well as appropriate actions (i.e., allow the animal to leave on its own, contact a wildlife professional, etc.) is an effective mitigation against unintended impacts to wildlife.

In addition to the mitigation measures and operational constraints noted in this section, specific measures and commitments will need to be identified during preliminary and/or detailed design once the proposed work for each of the structures has been confirmed.

7.0 Ecological Benefit Opportunities

7.1 Restoration

As a component of the Project, removal of Allan's Bridge and reconstruction of the Macdonell Bridge will create areas of disturbed earth that will require stabilization. Restoring disturbed areas along the river in the footprint of the removed Allan's Bridge and other areas of disturbance with native vegetation, specifically with pollinator species, provides an opportunity to enhance this habitat, as described in the City's Pollinator Habitat policy (4.1.7.4).

Riparian plantings that provide shade, cover and nutrient inputs to the river, not only enhance the corridor linkage, but also enhance the fish habitat below. While supporting pollinator habitat, indigenous tree or shrub plantings have opportunity to benefit both the aquatic and terrestrial systems.

Flora within the Study Area is a mixture of common or planted native and non-native species, with some of the latter being considered invasive. Vegetation removal throughout the Study Area to support construction, along with appropriate pre-clearing vegetation controls, provides an opportunity for invasive species removal in accordance with the City's Invasive Species policy (4.1.7.1).

7.2 Stormwater Treatment

The existing Macdonell Bridge has ten 6-inch deck drains that outlet road runoff directly to the Speed River below. The new bridge design has opportunity to remove the deck drains entirely, instead divert this stormwater runoff to larger catch basins at the lower end of the bridge. From the catch basins, the water can be conveyed through a filtration system, like an Oil & Grit Separator (OGS) prior to release to the river; thereby reducing the contaminant load to the aquatic ecosystem.

8.0 Permits and Approvals

8.1 GRCA

The majority of the Study Area is within the Regulation Limit of the GRCA under O. Reg. 41/42. The Project will require a permit from GRCA to proceed, supported in part by the erosion control and site restoration recommendations provided in this report and in the contract drawings.

8.2 DFO

As the recommended preferred solutions will require in-water work, impacts to fish and fish habitat are anticipated. As such, a Request for Review will be required for DFO to determine the Project compliance under the *Fisheries Act*.

9.0 Conclusions and Future Work

This report documents the existing conditions, preliminary impacts and recommended mitigation measures within the Macdonell Street Study Area, supported by desktop and field studies completed in 2022. These studies included a single season review for rare and at-risk species, vegetation community classification and floral inventory, fish habitat assessment, wildlife habitat assessment, and incidental wildlife observations.

The Speed River is a coolwater system that has coldwater restoration potential within the Study Area. This system provides suitable habitat for a diverse community of aquatic

species, as well as wildlife habitat for species of conservation concern, in particular turtles, and is confirmed habitat for Rare and Special Concern Species. The Speed River is also associated with Significant Valleylands that border the watercourse helping to buffer the channel from adjacent development-related disturbances.

The preferred solution is not anticipated to cause negative impacts to the natural environment, features, or their ecological functions. Design should consider minimizing encroachments into sensitive features, such as the Speed River, with the exception of activities intended to result in a net ecological benefit, as noted in Section 7.0. Design should also consider surface drainage patterns and sedimentation of the river from works within the Study Area; as well as schedule work to outside of timing windows identified in Section 6. Appropriate mitigation measures should be incorporated into the design to reduce impacts to the natural heritage system when impacts can not be avoided. When negative impacts of a proposed activity cannot be mitigated, it is recommended the activity be avoided. During preliminary and/or detailed design, a scoped Environmental Impact Study (EIS) should be undertaken, including an inventory of trees, to determine the Project impact details, prepare a robust mitigation plan and identify the compensation requirements.

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