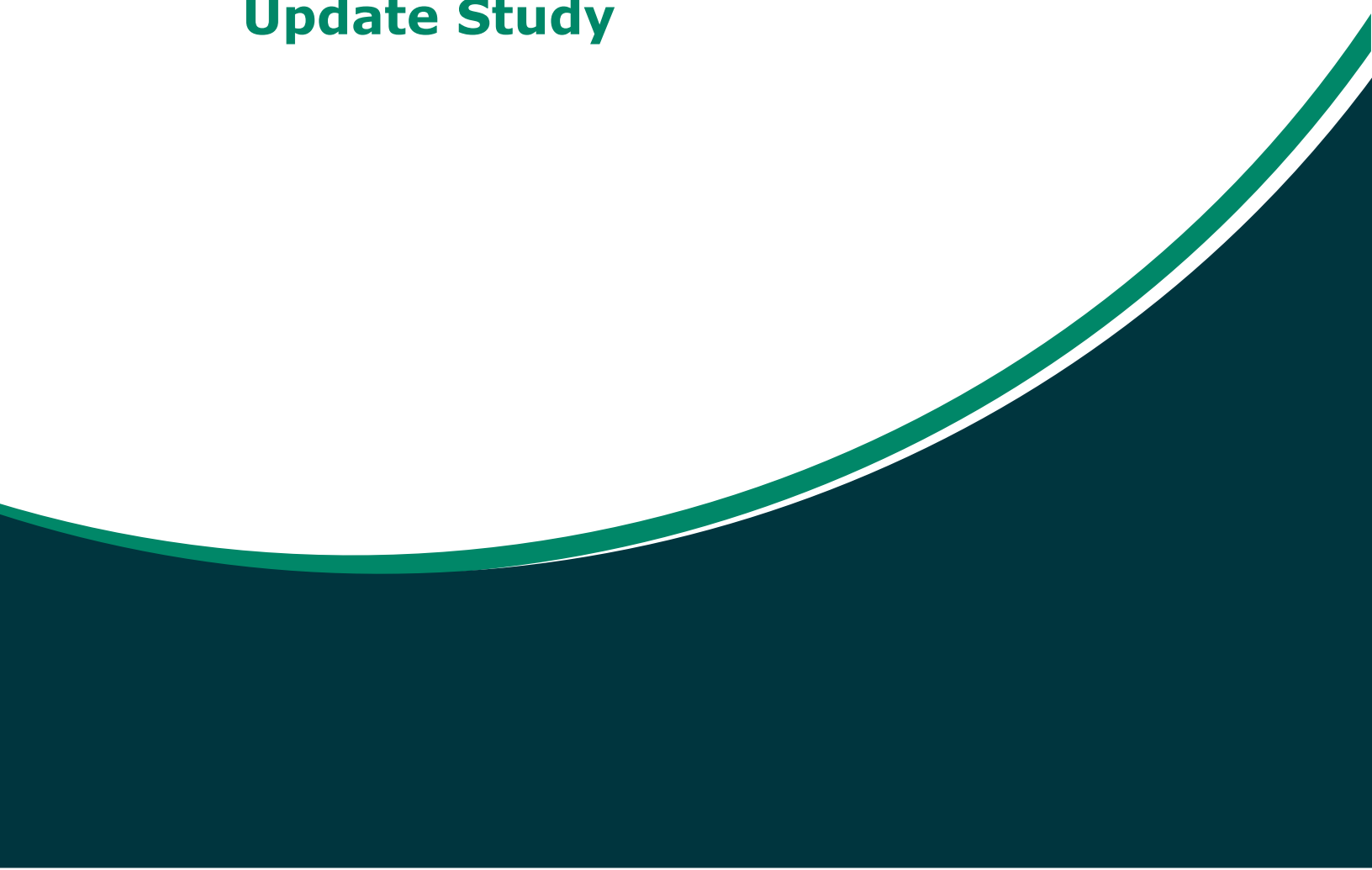


Appendix A

**Natural Environment
Considerations for Alternatives –
Guelph Water Supply Master Plan
Update Study**

A decorative graphic element consisting of a thick, dark teal curved line that starts from the bottom left, curves upwards and to the right, and then curves back down towards the bottom right, creating a wave-like shape that separates the text from the bottom of the page.

To: Dave Belanger, City of Guelph
From: Jillian deMan, Olga Hropach
Date: October 26, 2021
Project #: 60612820

Memorandum

Subject: Natural Environment Considerations for Alternatives – Guelph Water Supply Master Plan Update Study

1. Introduction

The City of Guelph is completing a water supply master plan update that is investigating a variety of water supply alternatives to service demand to the year 2051. Alternatives include water conservation and demand management, expansion of the existing groundwater supply system, optimization of existing wells, installation of new wells within and outside the City's boundaries and the establishment of new local surface water supply locally.

This memo presents the initial assessment of potential impacts of alternatives in relation to natural heritage features such as wetlands, watercourses, fisheries, Species at Risk, and Areas of Natural and Scientific Interest. Due the conceptual nature of this Master Plan Study, existing information was referenced to determine the location of natural heritage areas. The following documents were reviewed:

Official Plans

- City of Guelph Official Plan
- Wellington County Official Plan

Other Documents

- City of Guelph Natural Heritage Strategy
- Grand River Conservation Authority website
- Soil Survey of Wellington County

- Ontario Reptile and Amphibian Atlas
- Ontario Butterfly Atlas
- Department of Fisheries and Oceans Species at Risk Mapping
- Ministry of Natural Resources and Forestry, Natural Heritage Information Centre website
- Wellington County website Interactive Mapping Tool
- Atlas of the Breeding Birds of Ontario
- Mammals of Ontario
- iNaturalist Online

2. Natural Environment

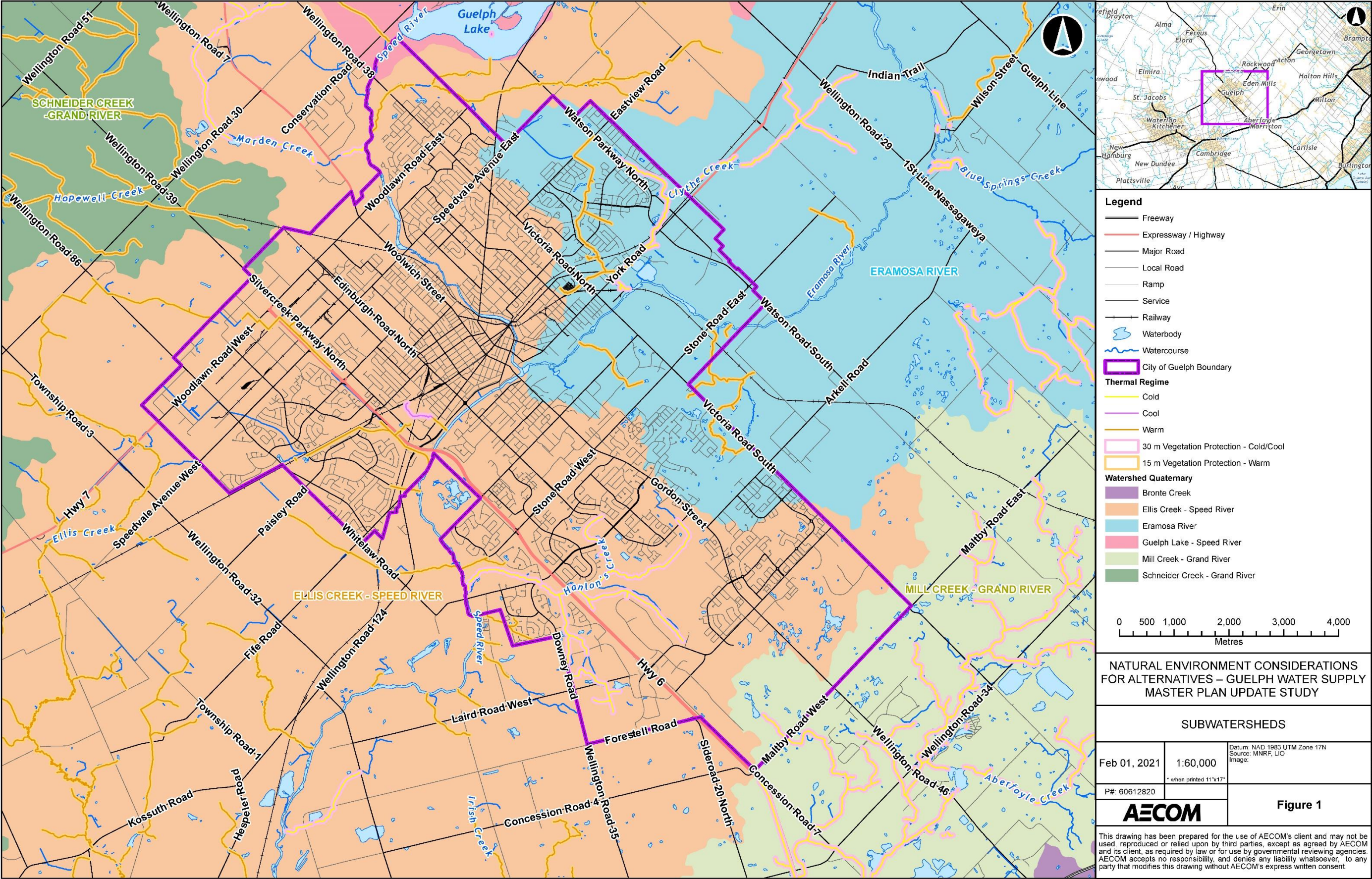
The various servicing alternatives are restricted to Wellington County (City of Guelph, Puslinch Township, Guelph/Eramosa Township).

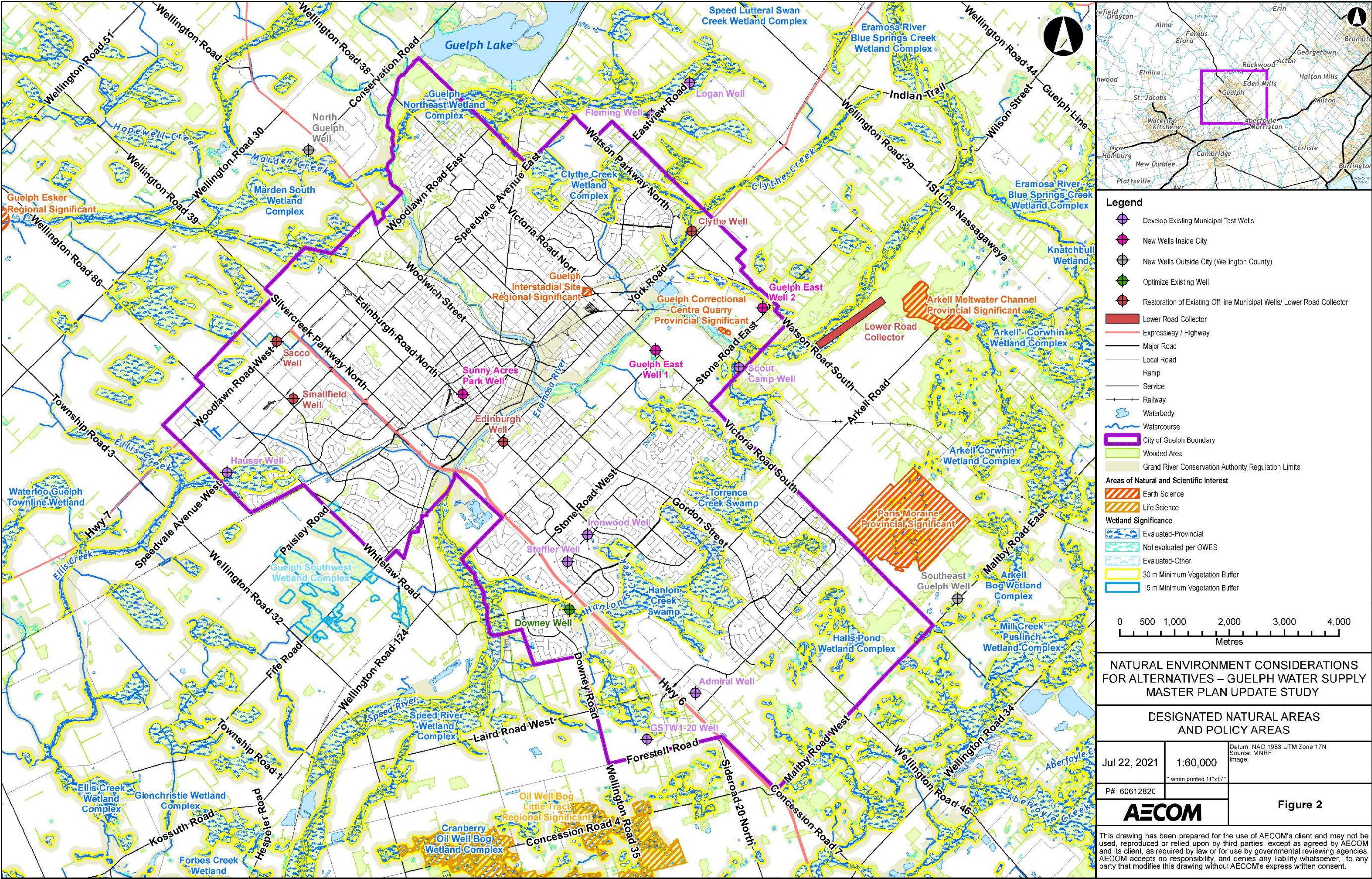
The following provides a general description of the natural environment within the study area. Each individual Class EA for the identified water supply alternatives will include a more detailed review utilizing Wetland Evaluations, Environmental Significant Area Reports and Fisheries Information.

2.1 City of Guelph

With a total coverage of approximately 22%, the City of Guelph contains a fairly diverse natural heritage system comprised primarily of wetland complexes, woodlands and ravines associated with the City's river systems (City of Guelph, 2018). The City of Guelph includes the following natural heritage features (refer to **Figures 1 and 2**):

- Five Subwatershed/Watershed Areas:
 - Schneider Creek-Grand River;
 - Ellis Creek-Speed River;
 - Eramosa River;
 - Guelph Line-Speed River; and
 - Mill Creek-Grand River.
- Three Areas of Natural and Scientific Interest (ANSIs):
 - Paris Moraine Provincial Earth Science;
 - Guelph Correctional Centre Quarry Provincial Earth Science; and
 - Guelph Interstadial Site Regional Earth Science.





- Ten Provincially Significant Wetlands (PSWs) Complexes (partially or entirely):
 - Clythe Creek Wetland Complex;
 - Ellis Creek Wetland Complex;
 - Eramosa River Blue Springs Creek Wetland Complex;
 - Guelph Northeast Wetland Complex;
 - Halls Pond Wetland Complex;
 - Hanlon Creek Swamp;
 - Marden South Wetland Complex;
 - Mill Creek Puslinch Wetland Complex
 - Speed River Wetland Complex; and,
 - Torrance Creek Swamp.
- One Locally Significant Wetland (LSW):
 - Guelph Southwest Wetland Complex.
- The Speed, Eramosa, Hanlon, Torrance, Clythe and Ellis River Systems;
- Several Locally Significant Woodland Areas (i.e., of 1 ha or greater); and
- Large areas of what are currently identified as ecological corridors, buffers and linkages (i.e., ‘Other Natural Heritage Features’ in the Official Plan, March 2018 consolidation).

Attachment A presents a copy of Schedule 4 “Natural Heritage Features and Development Constraints”, from the City Guelph’s Official Plan as well a copy of Schedule 2 “Land Use Plan”.

Within and surrounding the City, a total of 58 species listed as Endangered, Threatened or Special Concern (referred to as Species at Risk [SAR]) under the Endangered Species Act, 2007 (ESA) have been recorded (refer to **Attachment B** for a comprehensive list). Species that have been observed more recently in the last 20 years within the City of Guelph include: Least Bittern (*Ixobrychus exilis*), Prothonotary Warbler (*Protonotaria citrea*), Butternut (*Juglans cinera*), Blanding’s Turtle (*Emydoidea blandingii*) and Redside Dace (*Clinostomus elongatus*).

As stated in the City of Guelph’s Official Plan, the protection and enhancement (where appropriate) of natural heritage features and their associated ecological functions is required. Natural heritage features are defined as areas containing significant wetlands and other wetlands, significant habitats of endangered and threatened species, significant ANSIs, surface water features and fish habitat, significant woodlands, significant landform, significant valleylands, ecological linkages and significant wildlife

habitat, restoration areas, habitat of significant species and cultural woodlands. Minimum buffer areas are created in order to prevent damage and degradation to associated natural heritage features and areas that are part of the Natural Heritage System. Minimum buffer areas for each type of natural heritage feature are presented in **Table 1** and should be considered for designing and siting alternative solutions (City of Guelph, 2021). Additionally, wildlife crossing locations are another feature included in the natural heritage system which have been created to minimize and mitigate impacts to wildlife, property damage and threats to human safety; however, these areas have no buffer requirements in direct association with them. As an additional consideration, the Grand River Conservation Authority (GRCA) has regulation areas within the City of Guelph which are used to control flooding, erosion, dynamic beaches, pollution and the conservation of land. Development is not permitted within these areas unless a permit is acquired from the GRCA.

Table 1: Minimum Buffers to Natural Heritage Features

Natural Heritage Features and Areas	Width of Minimum Buffers
Significant Areas of Natural and Scientific Interest (ANSIs)	No minimum buffer
Significant Habitat for Provincially Endangered and Threatened Species	No minimum buffer
Significant Wetlands i. Provincially Significant Wetlands ii. Locally Significant Wetlands	i. 30 m ii. 15 m
Surface Water and Fish Habitat i. Cold/cool water fish habitat ii. Warm water fish habitat, permanent and intermittent streams and undetermined fish habitat	i. 30 m ii. 15 m
Significant Woodlands	10 m from the drip line
Significant Valleylands	No minimum buffer
Significant Landform	No buffer required
Significant Wildlife Habitat i. Deer Wintering Areas and Waterfowl Overwintering Areas ii. Significant Wildlife Habitat iii. Ecological Linkages	i. No minimum buffer ii. No minimum buffer iii. No buffer required
Other Wetlands	No minimum buffer
Cultural Woodland	No minimum buffer
Potential Habitat for Significant Species (excluding provincially Endangered and Threatened Species)	No minimum buffer

Source: City of Guelph, 2021

2.2 Wellington County

The topography and geology of Wellington County on a whole is made up of elongated hills, known as drumlins. These occupy much of the southern and northern parts of Wellington County, while the central part consists of undulating moraine. In general, the land slopes from east to west and from north to south. Some of the drainage features include the Grand, Speed and Eramosa Rivers, the Grand being the most prominent. Guelph Lake, a result of the construction of Guelph Lake Dam in 1974, is located north of the City.

Loam textured till materials predominate in the northern and southern ends of the County. The till plains in these areas are drumlinized and contain many low broad oval hills with smooth slopes that are characteristic of drumlins.

A total of 58 SAR are known to occur within Wellington County. In addition to this, one species that has been designated as Special Concern by the Committee on the Status of Endangered Wildlife in Canada but has no status in Ontario is also known to occur within Wellington County. A list of these species and their habitat preferences is included in **Attachment B**. A SAR habitat screening will be completed for each selected preferred alternative in future project phases.

Natural heritage features are located throughout the County and include PSWs, LSWs, unevaluated wetlands, ANSIs and woodlands.

Attachment C presents a copy of Appendix 1 “South Wellington Watershed Study Areas” and Appendix 3 “Provincially Significant Wetlands”.

3. Impact Assessment

This section discusses the potential impacts of the various alternatives on the natural environment. As expected, those alternatives which rely solely on conservation/demand management will not have as many anticipated impacts as those alternatives that require obtaining water supply from groundwater or surface water sources.

It should be noted that this assessment is of a general nature and further investigations will be required in individual Class EA studies to determine potential impacts with regards to specific natural heritage features.

Table 2 presents the potential impacts of each alternative.

Table 2: Potential Impacts of Each Alternative

Sources	Alternative	Potentially Affected Natural Heritage Features	Potential Impacts	Recommendations/Notes
Groundwater Sources	■ Optimize Existing Downey Well ■ Improvement of well performance to yield additional capacity	■ The existing Downey Well is located near or adjacent to Hanlon's Creek and the Provincially Significant Hanlon Creek Swamp.	■ By increasing the total water supply capacity through enhancement of the existing well, a slight reduction in surface water and wetland water levels might occur. Potential impacts include: – Reduction of viable fish/ amphibian habitat within wetland and river systems; – Alteration of plant community composition and wildlife habitat through change of riparian/emergent and submergent zones, as well as alteration in hydrology; potential for increase in invasive plant colonization of transition zones; and – Alteration of overall water temperature (i.e. shallower water levels result in higher temperature regimes)	■ Further Studies/ Class EAs should include the following tasks: – Conduct field investigations to determine existing conditions of aquatic/terrestrial habitat within the watercourse and wetland systems within proximity of wells; – Obtain Wetland Evaluation Reports, fisheries and Species at Risk information for within at least 120 m of the proposed site from secondary sources and agency consultation with MECP, MNRF and GRCA; – Provision of more detailed Impact Assessment; and – Determination of Mitigation Measures specifically addressing groundwater impacts.
Groundwater Sources	■ Restoration of Existing Off-line Municipal Wells/ Lower Road Collector ■ Wells/ Collector have existing Permits to Take Water, but City has discontinued use due to concerns with water quality. Wells/ Collector require upgrades to address water quality for the following sites: – Lower Road Collector – Edinburgh well – Clyde well – Sacco well – Smallfield well	■ Those existing wells which require treatment that are near or adjacent to natural heritage features include the Arkell Lower Road Collector (near Eramosa River and the Eramosa River Blue Springs Creek PSW complex), Edinburgh Well (near Speed River), Clyde Creek Well (near Clyde Creek PSW complex and Clyde Creek), Sacco Well (near Marden South PSW Complex) and Smallfield well (near a significant woodland).	■ Low potential adverse impacts are anticipated since this alternative utilizes existing well systems. However, with additional demand from groundwater resources, the following impacts could potentially include: – Reduction of viable fish/ amphibian habitat within wetland and river systems; – Alteration of plant community composition and wildlife habitats through change of riparian/emergent and submergent zones as well as alteration in hydrology; potential for increase in invasive plant colonization of transition zones; – Alteration of overall water temperature (i.e. shallower water levels result in higher temperature regimes); and – Construction related impacts including: loss of vegetation / wildlife habitat, increased sedimentation, noise disturbances, soil compaction, soil contamination etc.	■ Further Studies/ Class EAs should include the following tasks: – Conduct field investigations to determine existing conditions of aquatic/terrestrial habitat within the watercourse and wetland systems within proximity of wells; – Obtain Wetland Evaluation Reports, fisheries and Species at Risk information for within at least 120 m of the proposed site from secondary sources and agency consultation with MECP, MNRF and GRCA; – Provision of more detailed Impact Assessment; and – Determination of Mitigation Measures specifically addressing groundwater impacts. – -Of note, a Class EA for the Clyde Well Treatment Upgrades has already been completed by Blueplan Engineering for the City of Guelph in 2018. The EA report is available at the following link: https://guelph.ca/wp-content/uploads/Clyde-Well-Treatment-Upgrades-Class-Environmental-Assessment.pdf

Sources	Alternative	Potentially Affected Natural Heritage Features	Potential Impacts	Recommendations/Notes
Groundwater Sources	■ Develop Existing Municipal Test Wells ■ Construction of wells at or near location of existing municipal test wells at the following sites: – -Scout camp well – -Steffler well – -Ironwood well – -Fleming well – -Logan well – -Hauser well – -GSTW1-20 well – -Admiral well	■ The test wells that may be developed into municipal production wells that are near or adjacent to natural heritage features include Steffler & Ironwood (near Hanlon Creek Swamp PSW); Scout Camp (near Torrance Creek Swamp PSW); Fleming & Logan (near Guelph Northeast PSW Complex); Hauser (near Ellis Creek PSW Complex); and GSTW1-20 (Hanlon Creek Swamp PSW). ■ The Admiral test well is not located near or adjacent to natural heritage features as its situated in a commercial/ industrial urban setting.	■ By increasing the total water supply capacity through enhancement of existing wells, a slight reduction in surface water and wetland water levels might occur. Potential impacts include: – Reduction of viable fish/ amphibian habitat within wetland and river systems; – Alteration of plant community composition and wildlife habitats through change of riparian/emergent and submergent zones as well as alteration in hydrology; potential for increase in invasive plant colonization of transition zones; – Alteration of overall water temperature (i.e. shallower water levels result in higher temperature regimes); and – Construction related impacts including: loss of vegetation / wildlife habitat, increased sedimentation, noise disturbances, soil compaction, soil contamination etc. ■ Minimal potential impact on natural heritage features are anticipated for the Admiral test well as its not located adjacent to natural heritage features.	■ Further Studies/ Class EAs should include the following tasks: – Conduct field investigations to determine existing conditions of aquatic/terrestrial habitat within the watercourse and wetland systems within proximity of wells; – Obtain Wetland Evaluation Reports, fisheries and Species at Risk information for within at least 120 m of the proposed site from secondary sources and agency consultation with MECP, MNRF and GRCA; – Provision of more detailed Impact Assessment; and – Determination of Mitigation Measures specifically addressing groundwater impacts. – Of note, the City has initiated a Class EA to evaluate potential additional water supply sources in southwest Guelph. This project will evaluate the Ironwood, Steffler and GSTW1-20 test wells.
Groundwater Sources	■ New Wells Outside City (Wellington County) ■ The Tier 3 model was used to identify areas of potential water supply without impacting watersheds already identified as under stress for the following sites: – -Guelph Southeast – -Guelph North	■ Those areas where new wells will potentially be installed, include: Guelph Southeast (near the Arkell Bog and the Mill Creek Puslinch PSW Complexes), Guelph North (near the Marden South PSW Complex).	■ By increasing the total water supply capacity through the installation of new wells, reduction in surface water and wetland water levels might occur. Potential impacts include: – Reduction of viable fish/ amphibian habitat within wetland and river systems; – Alteration of plant community composition through change of riparian/emergent and submergent zones; potential for increase in invasive plant colonization of transition zones; – Alteration of overall water temperature (i.e. shallower water levels result in higher temperature regimes); and – Construction related impacts including: loss of vegetation, increased sedimentation, noise disturbances, soil compaction, soil contamination etc.	■ Further Studies/ Class EAs should include the following tasks: – Conduct field investigations to determine existing conditions of aquatic/terrestrial habitat within the watercourse and wetland systems within proximity of wells; – Obtain Wetland Evaluation Reports, fisheries and Species at Risk information for within at least 120 m of the proposed site from secondary sources and agency consultation with MECP, MNRF and GRCA; – Provision of more detailed Impact Assessment; and – Determination of Mitigation Measures specifically addressing potential erosion impacts.

Sources	Alternative	Potentially Affected Natural Heritage Features	Potential Impacts	Recommendations/Notes
Groundwater Sources	■ Dolime Quarry Alternatives – <u>Option 1</u>: Capture groundwater that flows to quarry using existing municipal wells and test wells; option requires construction of pumping station to maintain quarry water level at optimal elevation, discharge would remain to Speed River as is currently permitted. – <u>Option 2</u>: Construct Water Treatment Plant to treat raw water from the quarry and pump to distribution. Regular discharge to the Speed River would cease.	■ Option 1: any natural heritage features as identified above for existing wells may be potentially affected. ■ Option 2: Depending on proximity of the new water treatment plant to natural heritage features, there may be potential effects on the natural environment.	■ For both options, by increasing the total water supply capacity through increasing the pumping volume/rate at existing wells, reduction in surface water levels might occur. Potential risks are minimized as long-term dewatering has occurred at the Dolime Quarry and new water supply developed under this alternative will represent a portion of the groundwater typically dewatered from the quarry. Potential impacts to be assessed at the locations of the test wells include: – Reduction of viable fish/ amphibian habitat within the river system; – Alteration of plant community composition through change of riparian/emergent and submergent zones; potential for increase in invasive plant colonization of transition zones; – Alteration of overall water temperature (i.e. shallower water levels result in higher temperature regimes); and, – Construction related impacts including: loss of vegetation, increased sedimentation, noise disturbances, soil compaction, soil contamination etc. ■ Option 1 provides reduced potential impact to the water balance of the Speed River system by maintaining some direct discharge of collected groundwater to the river relative to Option 2, which would treat and pump collected groundwater to distribution and cease discharge to the Speed River.	■ Further Studies/ Class EAs should include the following tasks: – Conduct field investigations to determine existing conditions of aquatic/terrestrial habitat within the watercourse and wetland systems within proximity of wells; – Obtain Wetland Evaluation Reports, fisheries and Species at Risk information for within at least 120 m of the proposed site from secondary sources and agency consultation with MECP, MNRF and GRCA; – Provision of more detailed Impact Assessment; and – Determination of Mitigation Measures specifically addressing groundwater impacts. – Of note, the City has initiated a Class EA to evaluate potential additional water supply sources in southwest Guelph. This project will evaluate the options presented for the Dolime Quarry.
Aquifer Storage Recovery (ASR)	■ ASR Guelph Lake/ Arkell Spring Collectors ■ Storage of treated (potable) water in aquifers near Guelph Lake/ Arkell Spring Grounds during periods of water surplus and subsequent recovery of volume stored during periods of high demand.	■ ASR is most effective in areas where there is high aquifer transmissivity and the potential to develop ASR wells with a corresponding high specific capacity. ■ In concept, the ASR system would consist of a series of wells in a wellfield that would store treated water (dechlorinated) in the deep bedrock (i.e. injection mode) when the water was available from the treatment system. When water was required from storage, the same wells would be used to recover the water (i.e. extraction mode). The recovered water would require disinfection prior to distribution. ■ Areas affected through water storage via Guelph Lake include Guelph Lake and its associated wetland and aquatic features (i.e. Guelph Northeast Provincially Significant Wetland).	■ The process of storage/recovery of surplus water in a given area in theory keeps the existing water capacity at base level. - The potential for groundwater contamination (i.e. nutrient leaching). This potential impact is minimized through treatment to potable standards prior to injection and completion of a geochemical assessment to ensure injection of compatible water. – Depending on the location of the wells, impacts to the natural environment in terms of sedimentation/ vegetation clearing, noise etc. might occur during the construction phase.	■ Further Studies/ Class EAs should include the following tasks: – Field investigations to determine existing conditions and aiding in determination of appropriate location for the well field; – Obtain Wetland Evaluation Reports, Fisheries and Species at Risk information for wetlands and watercourses; – Provision of more detailed Impact Assessment; – Species at Risk Inventories targeting species sensitive to hydrologic changes; – Amphibian surveys within wetland communities; and

Sources	Alternative	Potentially Affected Natural Heritage Features	Potential Impacts	Recommendations/Notes
Surface Water Sources	■ Local Surface Water from Guelph Lake	■ Areas affected through water taking via Guelph Lake include Guelph Lake and its associated wetland and aquatic features (i.e. Guelph Northeast PSW and Speed River)	■ By increasing the total water supply capacity through additional taking of surface water, reduction in surface water and wetland water levels might occur. Potential impacts anticipated to be limited to the area between Guelph Lake and the Guelph Waste Water Treatment Plant where water taken for supply is returned to the river. Potential impacts include: – Reduction of viable fish/ amphibian habitat within lake and river systems; – Alteration of plant community composition through change of riparian/emergent and submergent zones; potential for increase in invasive plant colonization of transition zones; – Alteration of sensitive species habitat/range; – Alteration of overall water temperature (i.e. shallower waters result in higher temperature regimes)	■ Further Studies/ Class EAs should include the following tasks: – Conduct field investigations to determine existing conditions of potentially affected portions of aquatic/terrestrial habitat within proximity to Guelph Lake; – Obtain Wetland Evaluation Reports, Fisheries and Species at Risk information for wetlands and watercourses; – Provision of more detailed Impact Assessment; – Determination of Mitigation Measures specifically addressing impacts related to water drawdown; – Species at Risk Inventories targeting species sensitive to hydrologic changes; and – Amphibian surveys within wetland communities.
Other Water Source Alternatives	■ Conservation/Demand Management	■ Natural heritage features not affected.	■ No impacts to natural heritage features anticipated.	■ No further recommendations required
Other Water Source Alternatives	■ Limit Growth	■ This option applies to the entire study area.	■ May result in natural heritage feature impacts due to densification.	■ No further recommendations required
Other Water Source Alternatives	■ Do Nothing	■ Natural heritage features not affected.	■ No impacts to natural heritage features anticipated.	■ No further recommendations required

4. Mitigation Measures

The following general mitigation measures should be followed to minimize the potential significant impacts to the natural environment. These address all potential alternatives. More detailed measures should be determined during the Class EAs completed for the individual water supply projects included within the preferred solution and the subsequent Detailed Design phase of each project.

1. **Disruption of Baseflow** – Aside from water conservation, most of the mentioned alternatives rely on taking water from sources such as groundwater and surface water. The main associated potential impact is disruption of riverine/lacustrine baseflow. All alternatives should ensure that impacts to baseflow conditions are minimized to avoid adverse impacts to aquatic/wetland habitat whether it be from other sources or taking at specific times of year etc.
2. **Sedimentation** – There is a high potential for sedimentation within wetland/woodland communities and watercourses as a result of construction activities (i.e. pipe/well installation) where soils are disturbed. To minimize the potential for silt bearing water coming into natural heritage areas, a comprehensive sedimentation and erosion control strategy should be prepared which includes: timing windows for construction near watercourses (obtained from the Ministry of Natural Resources and Forestry and/or GRCA), sediment control fencing and restoration of disturbed areas/habitat etc.
3. **Dewatering Impacts During Construction** – During construction water levels during dewatering need to be maintained and discharge controlled so that it does not significantly alter the natural velocity of the receiving watercourse. A dewatering monitoring plan should be considered if sensitive features (e.g., wetlands) are located within the zone of influence of dewatering activities. Monitoring should include establishing baseline conditions, monitoring during and post dewatering activities to ensure there are no significant changes to potentially affected sensitive features. Associated potential impacts would be short term and not maintained following construction.
4. **Removal of Vegetation** – Proposed sites for wellfields/wells/facilities might require removal of vegetation. If required, a tree preservation plan should be prepared. For vegetation removed along the edge of a woodland, proper root pruning techniques should be utilized. Where

- required, areas should be replanted with native species. Vegetation removal is prohibited during the bird nesting season from April 1 to August 31 of any year. Other timing windows for sensitive wildlife may also apply.
5. **Contamination of Soils** – During construction, ensure that fuel storage, refueling and maintenance of equipment are handled properly. Prohibit use of construction equipment within watercourses/waterbodies. Contingency plans must be prepared before projects begin for control and clean up of a spill if one should occur.
 6. **Disturbance of Sensitive Species** – If determined that a sensitive species is present within a reasonable distance of a specific alternative, appropriate measures (i.e. transplant, avoidance, buffer determination) should be implemented to ensure their protection. Appropriate permits or authorization from the Ministry of the Environmental, Conservation and Parks (MECP) must be obtained if impacts cannot be avoided in confirmed SAR habitats.
 7. **Spread of Invasive Species** – During construction, invasive species such as Common Reed (*Phragmites australis*) may be inadvertently introduced or spread into sensitive habitats (e.g., PSWs). Machinery, equipment or vehicles should be cleaned in accordance with the *Clean Equipment Protocol for Industry – Inspecting and Cleaning Equipment for the Purposes of Invasive Species Prevention* (Halloran et al., 2016).

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October 26, 2021

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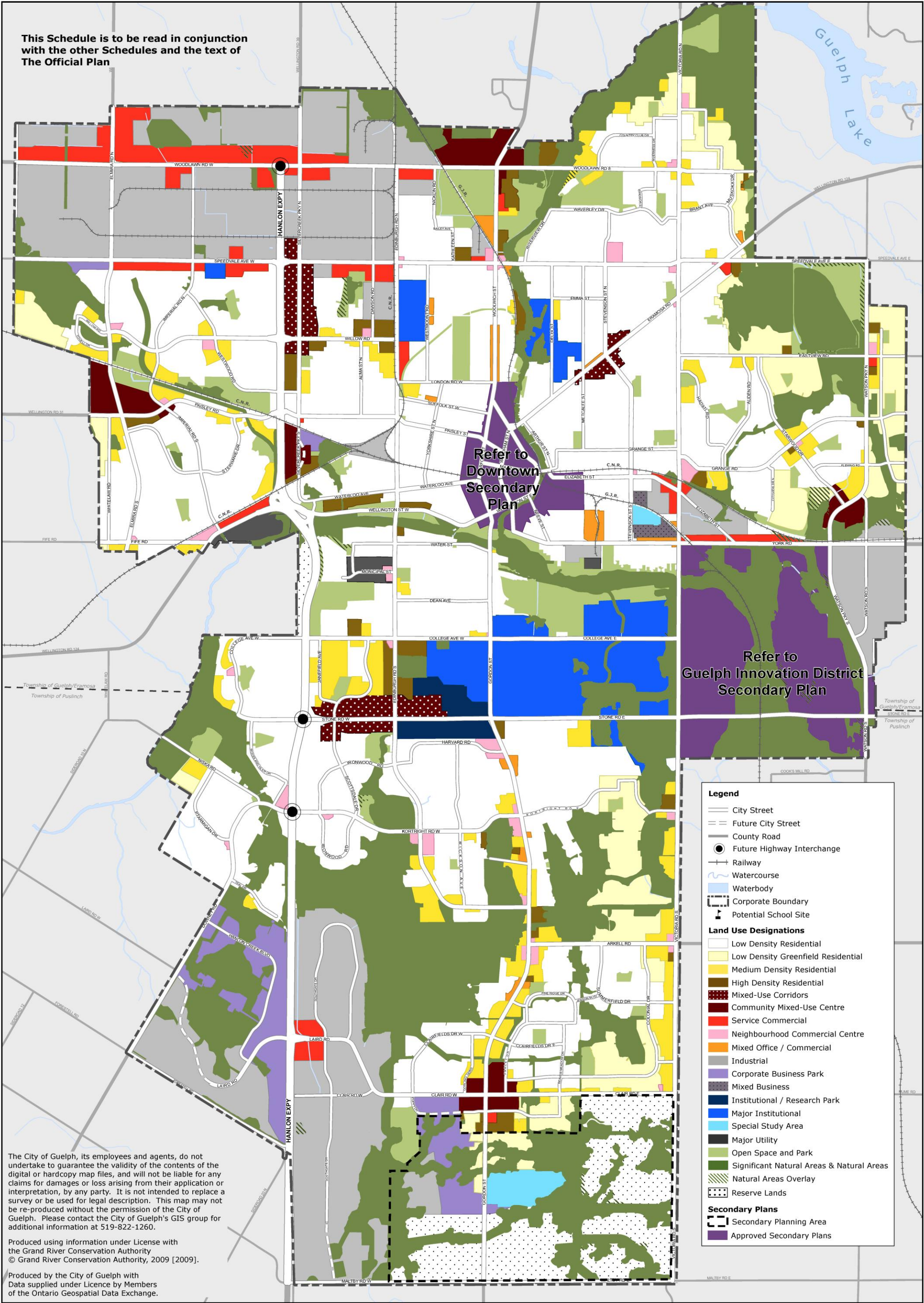
Wellington, County of:

Information available on the internet at <http://www.county.wellington.on.ca/>

Attachment A



This Schedule is to be read in conjunction with the other Schedules and the text of The Official Plan

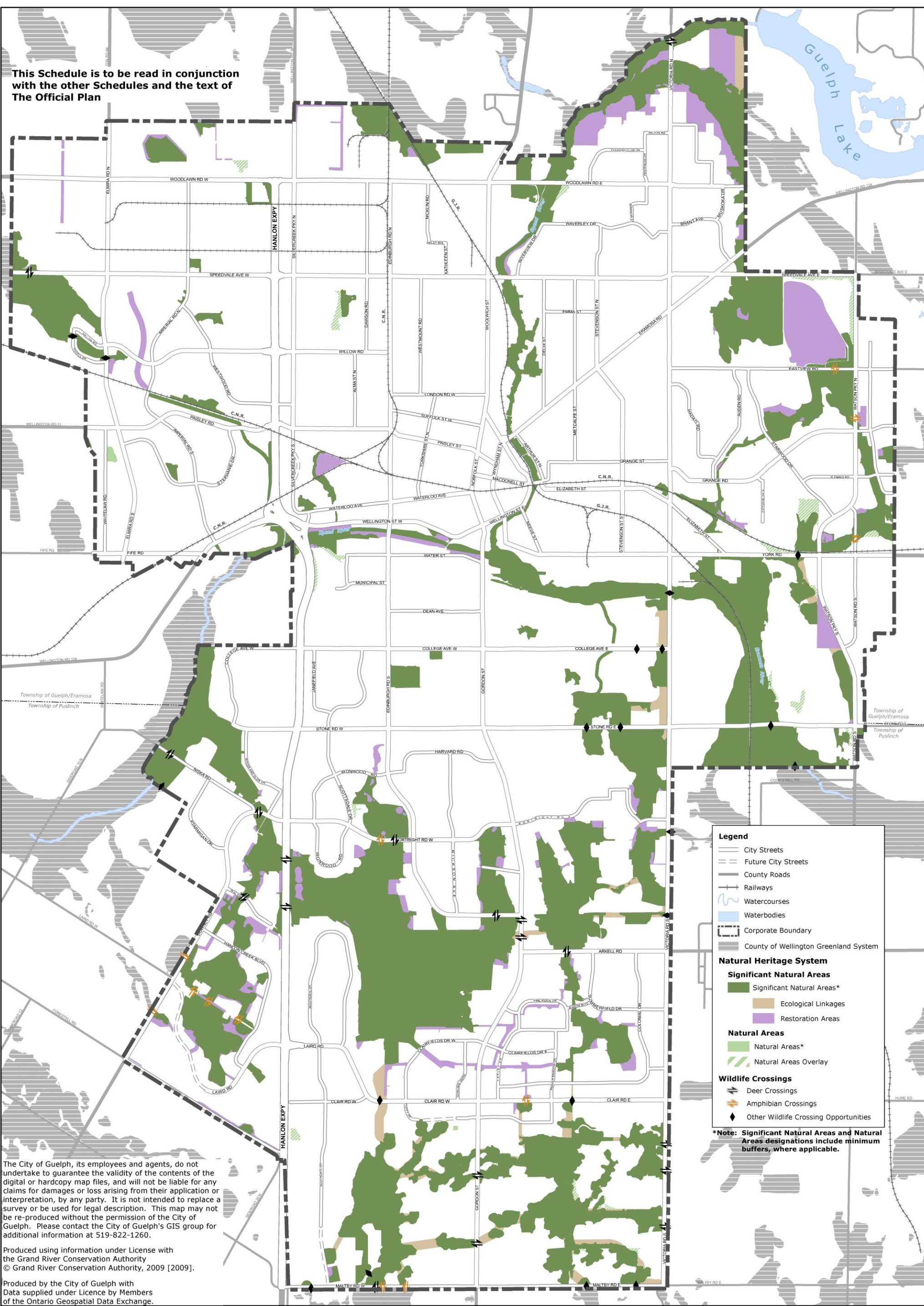


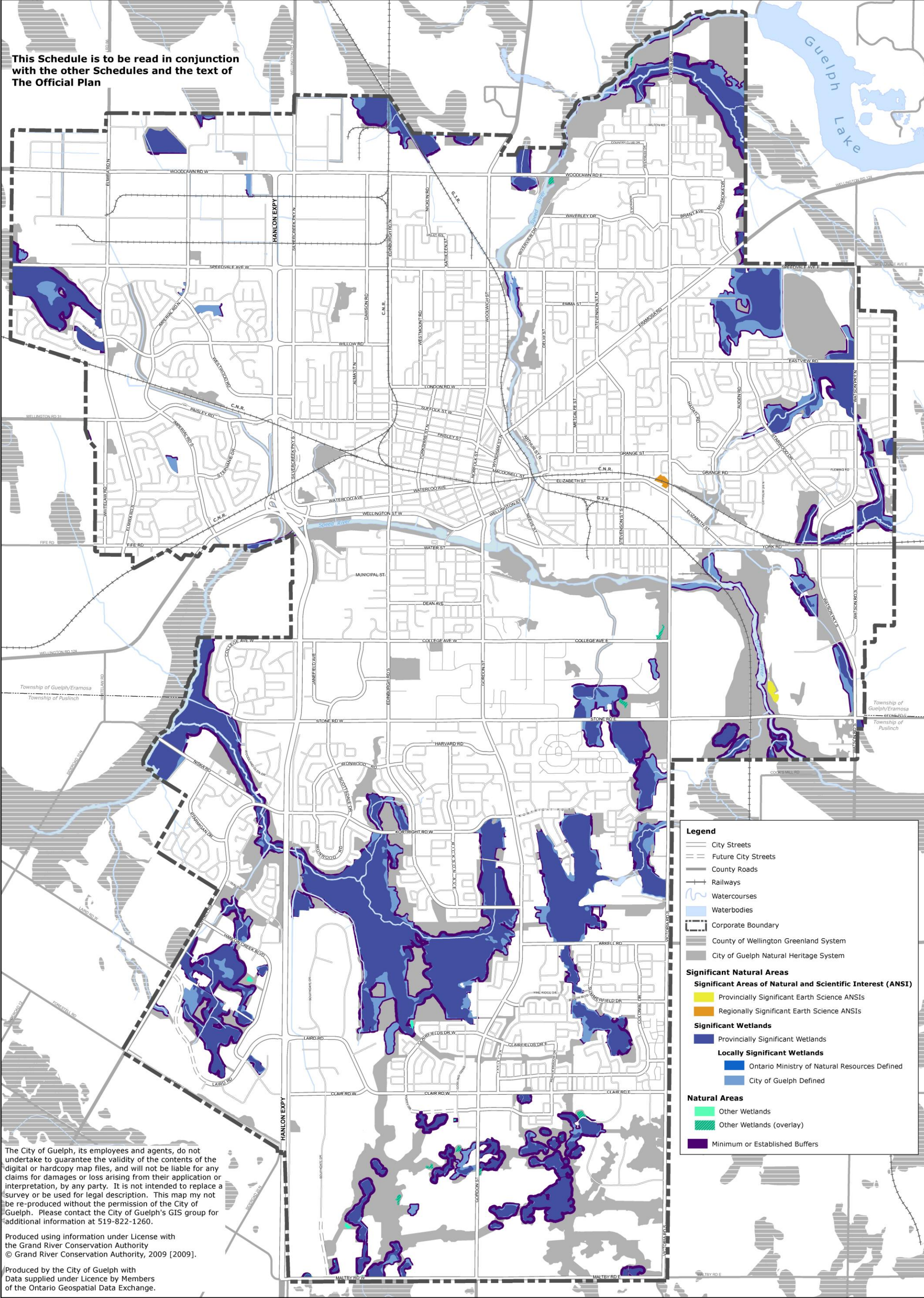
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Projection: UTM 17N NAD83
Produced by the City of Guelph
Planning Services
March 2018 Consolidation

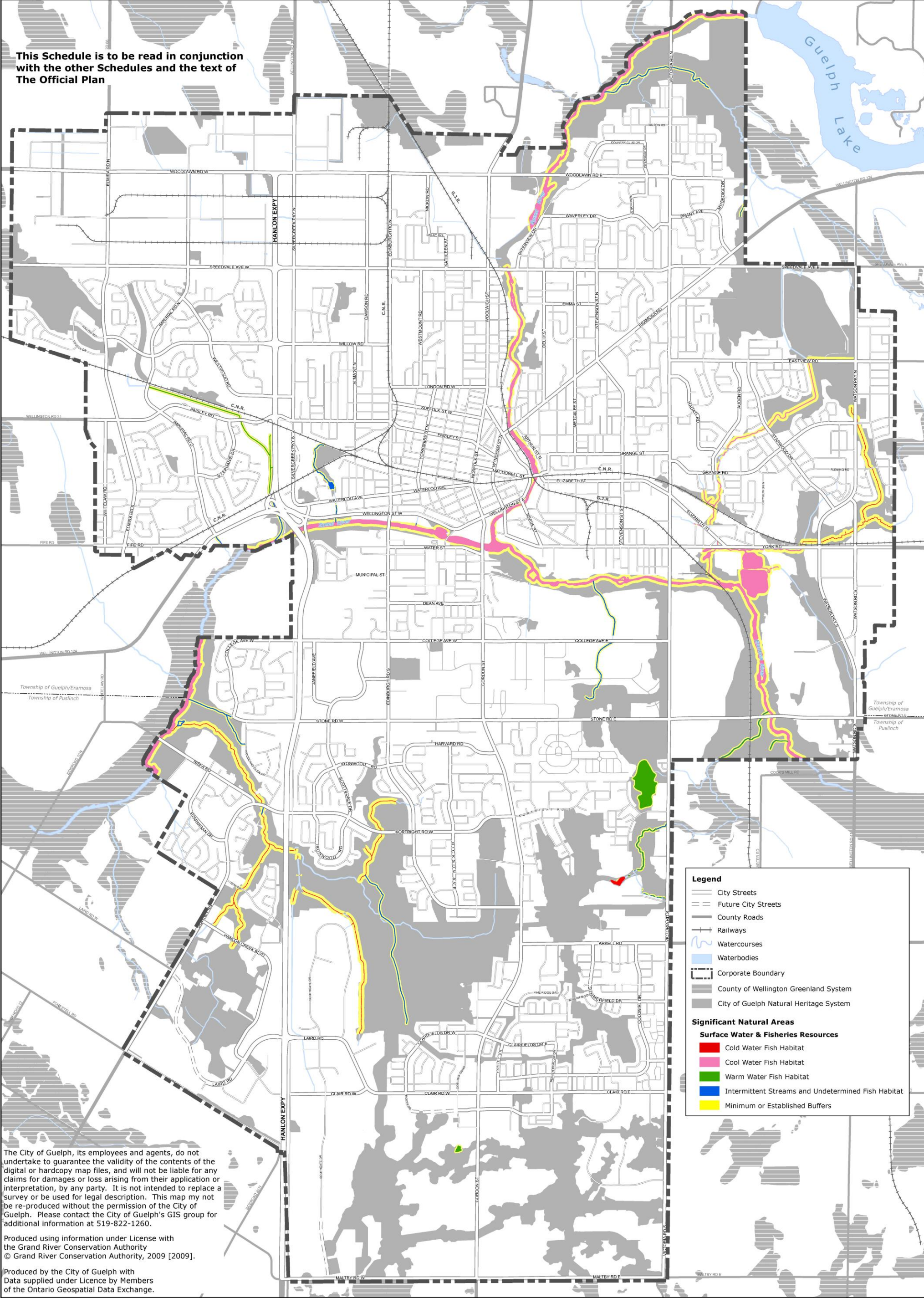
CITY OF GUELPH OFFICIAL PLAN SCHEDULE 2: LAND USE PLAN







This Schedule is to be read in conjunction with the other Schedules and the text of The Official Plan



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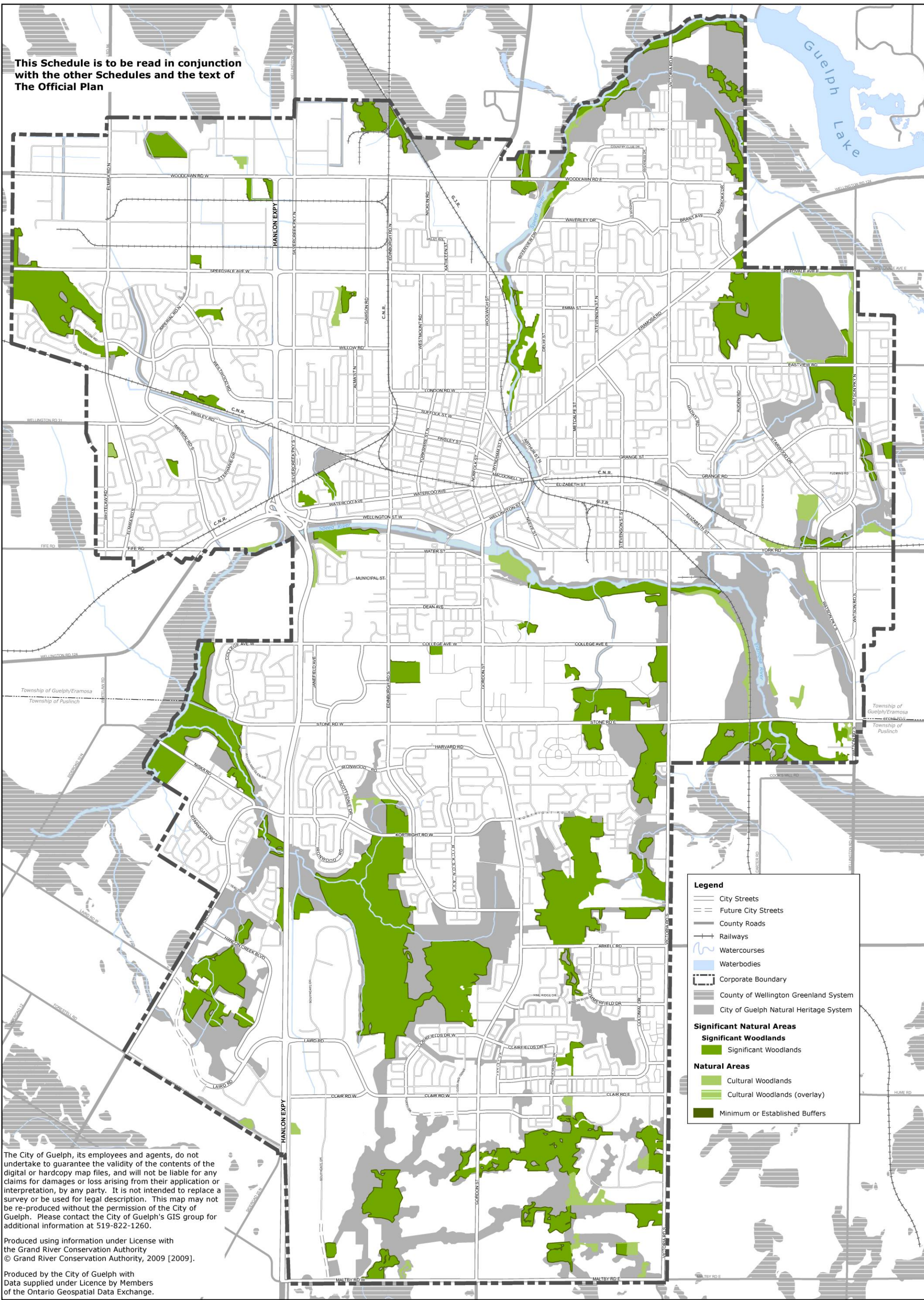
CITY OF GUELPH OFFICIAL PLAN SCHEDULE 4B: NATURAL HERITAGE SYSTEM Surface Water and Fish Habitat



Projection: UTM 17N NAD83
Produced by the City of Guelph
Planning Services
March 2018 Consolidation

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This Schedule is to be read in conjunction with the other Schedules and the text of The Official Plan



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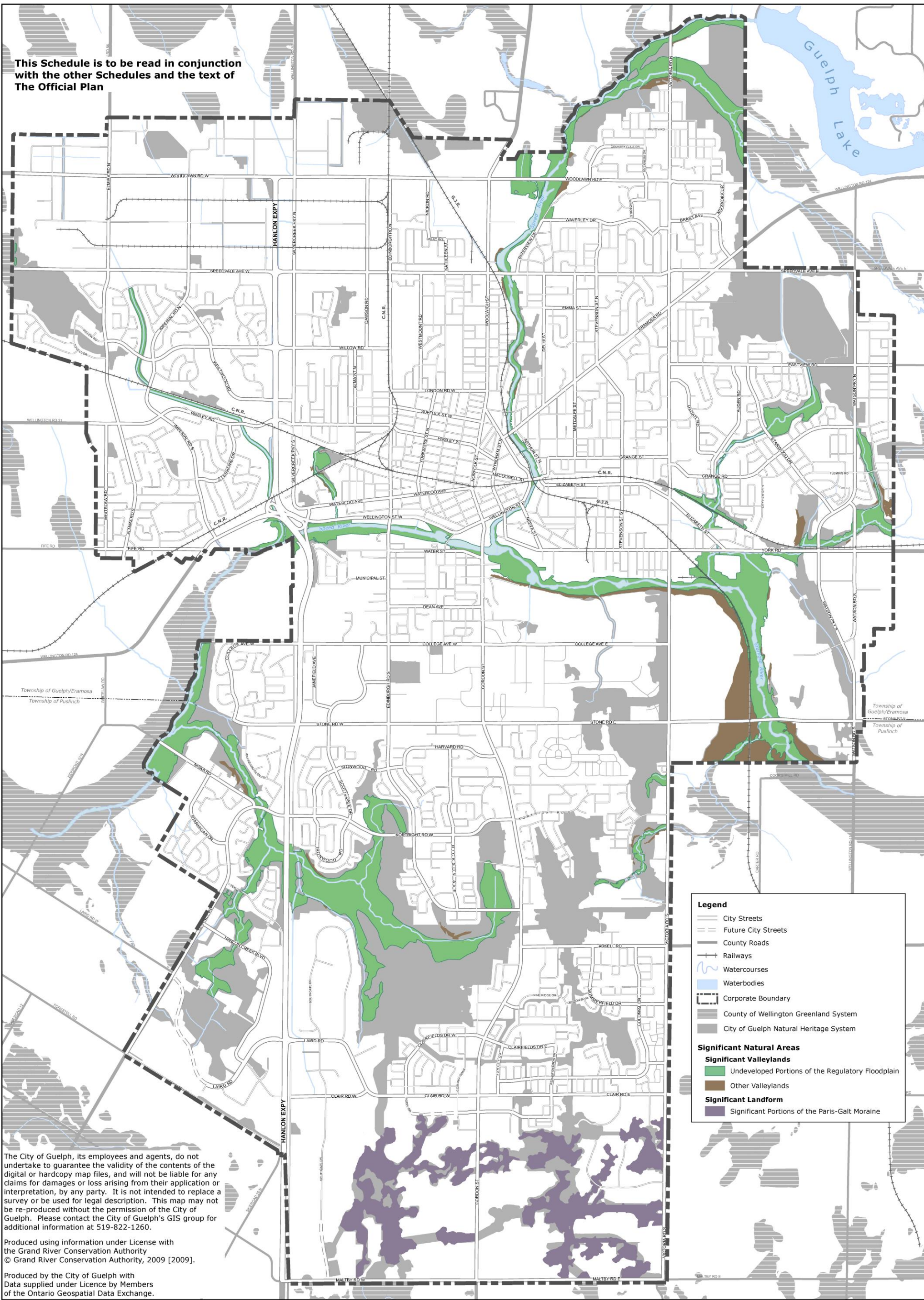
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Planning Services
March 2018 Consolidation

CITY OF GUELPH
OFFICIAL PLAN
SCHEDULE 4C:
NATURAL HERITAGE SYSTEM
Significant Woodlands



This Schedule is to be read in conjunction with the other Schedules and the text of The Official Plan



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CITY OF GUELPH OFFICIAL PLAN SCHEDULE 4D: NATURAL HERITAGE SYSTEM Significant Valleylands & Significant Landform



Attachment B



Attachment B. Guelph Water Supply Master Plan Updated Study, Species at Risk Habitat Screening

Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat	Known Species Range	Source Identifying Species Record
Plants	American Chestnut <i>Castanea dentata</i>	END	END Schedule 1	END	■ The American Chestnut prefers dryer upland deciduous forests with sandy, acidic to neutral soils. In Ontario, it is only found in the Carolinian Zone between Lake Erie and Lake Huron. The species grows alongside Red Oak, Black Cherry, Sugar Maple, American Beech and other deciduous tree species. ■ This species can typically be associated with the following ELC communities: FOD with dry sandy soil.	■ The American Chestnut has almost disappeared from eastern North America due to an epidemic caused by a fungal disease called the chestnut blight (<i>Cryphonectria parasitica</i>). In Canada, the American Chestnut is restricted primarily to southwestern Ontario. Based on information available in 2004, it was estimated that there are 120 to 150 mature trees and 1,000 or more small, young trees in the province.	■ NHIC
Plants	American Ginseng <i>Panax quinquefolius</i>	END	END Schedule 1	END	■ In Ontario, American Ginseng typically grows in rich, moist, but well-drained, and relatively mature, deciduous woods. It usually grows in deep, nutrient-rich soil over limestone or marble bedrock. ■ In Canada, ginseng grows in rich, moist, undisturbed, and relatively mature deciduous woods in areas of neutral soil (such as over limestone or marble bedrock). The forest canopy is usually dominated by Sugar Maple, White Ash, Bitternut Hickory, and Basswood. Colonies of ginseng are often found near the bottom of gentle south-facing slopes, where the microhabitat is warm and well-drained.	■ In Canada, it is found in southwestern Quebec and southern Ontario. In Ontario, concentrations occur along the Niagara Escarpment and the eastern edge of the Precambrian Shield. Only seven viable populations are known in Ontario.	■ iNaturalist, 2021
Reptiles	Butler's Gartersnake <i>Thamnophis butleri</i>	END	END Schedule 1	END	■ The Butler's Gartersnake prefers open, moist habitats, such as dense grasslands and old fields, with small wetlands where it can feed on leeches and earthworms. Burrows made by small mammals and even crayfish are sometimes used as hibernation sites, called hibernacula. This species is also commonly found in rock piles or old stonewalls. ■ This species can typically be associated with the following ELC communities: CUM and MAM.	■ The only place in the world where Butler's Gartersnake is found is in the lower Great Lakes region. In Ontario, this snake is concentrated in two areas: within 10 kilometres of the Detroit River, Lake St. Clair, the St. Clair River, and Lake Huron from Amherst Point to Errol, in Essex and Lambton counties and the Luther Marsh in Dufferin and Wellington counties. ■ Population sizes can vary. Estimates done at several sites in Ontario in 1997 ranged between 50 and 900 snakes. At some sites it is considered to be locally common.	■ NHIC
Plants	Butternut <i>Juglans cinerea</i>	END	END Schedule 1	END	■ In Ontario, Butternut usually grows alone or in small groups in deciduous forests. It prefers moist, well-drained soil and is often found along streams. It is also found on well-drained gravel sites and rarely on dry, rocky soil. This species does not do well in the shade, and often grows in sunny openings and near forest edges. ■ Butternut occurs primarily in neutral to calcareous soils of pH 5.5 to 8, often in regions with underlying limestone, and is generally absent from acidic regions. It tends to reach greatest abundance in rich well-drained mesic loams in floodplains, streambanks, terraces, and ravine slopes, but can occur in a wide range of other situations. In closed-canopy stands, it must be in the overstory to thrive. Seedling establishment, growth, and survival to maturity are most frequent in stand openings, riparian zones, and forest edges.	■ Butternut can be found throughout central and eastern North America. In Ontario, this species is found throughout the southwest, north to the Bruce Peninsula, and south of the Canadian Shield. ■ Butternut's native Canadian range is restricted to southern Ontario and Quebec (primarily south of the area bounded by Georgian Bay, the Ottawa Valley, and the Quebec City region), and western and southern portions of New Brunswick.	■ iNaturalist 2020
Mammals	Eastern Small-footed Myotis (Eastern Small-footed Bat) <i>Myotis leibii</i>	END	END Schedule 1	END	■ In the spring and summer, Eastern Small-footed Bats will roost in a variety of habitats, including in or under rocks, in rock outcrops, in buildings, under bridges, or in caves, mines, or hollow trees. These bats often change their roosting locations every day. At night, they hunt for insects to eat, including beetles, mosquitos, moths, and flies. In the winter, these bats hibernate, most often in caves and abandoned mines. They seem to choose colder and drier sites than similar bats and will return to the same spot each year.	■ The Eastern Small-footed Bat has been found from south of Georgian Bay to Lake Erie and east to the Pembroke area. There are also records from the Bruce Peninsula, the Espanola area, and Lake Superior Provincial Park. Most documented sightings are of bats in their winter hibernation sites.	■ Dobbyn, 1994
Plants	False Hop Sedge <i>Carex lupuliformis</i>	END	END Schedule 1	END	■ False Hop Sedge is most often grows in riverine swamps and marshes, and around temporary forest ponds. It prefers open areas and areas under forest canopy openings, with lots of sunlight. ■ This species can typically be associated with the following ELC communities: SWD, MAM, MAS along rivers and FOD with temporary forest ponds.	■ False Hop Sedge ranges from Florida and Texas north to Quebec and Ontario. In Ontario, seven occurrences are known to persist. In Quebec, there are three persisting populations and three populations that are being restored where False Hop Sedge is believed to have been extirpated. The largest populations occur in southern Ontario.	■ NHIC

Attachment B. Guelph Water Supply Master Plan Updated Study, Species at Risk Habitat Screening

Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat	Known Species Range	Source Identifying Species Record
Plants	Hoary Mountain-mint (Hoary Mountain Mint) <i>Pycnanthemum incanum</i>	END	END Schedule 1	END	- In Ontario, Hoary Mountain-mint mostly occurs in dry, oak woodland habitat, on steep, warmer-than-normal slopes. The species does best in open areas with ample sunlight, in habitats that depend on disturbance such as fire to maintain these conditions. - In Canada, the Hoary Mountain Mint is found on open, dry, sandy-clay habitats in open-canopied deciduous woods on relatively warm slopes. The prairie grasses Little Bluestem (<i>Schizachyrium scoparium</i>) and Big Bluestem (<i>Andropogon gerardii</i>) dominate one of the Hamilton sites.	In Canada, the species occurs only in southern Ontario. Initially there were two known extant locations, less than 2 km apart: Willow Point in Burlington, and Woodland Cemetery in Hamilton. A substantial new population was located in 2000, bringing the total of known extant locations to three, all found on the Burlington Bluffs in Hamilton and Burlington.	iNaturalist, 2019
Birds	Henslow's Sparrow <i>Ammodramus henslowii</i>	END	END Schedule 1	END	- In Ontario, the Henslow's Sparrow lives in open fields with tall grasses, flowering plants, and a few scattered shrubs. It has also been found in abandoned farm fields, pastures, and wet meadows. It tends to avoid fields that have been grazed or are crowded with trees and shrubs. It prefers extensive, dense, tall grasslands where it can more easily conceal its small ground nest. - This species can typically be associated with the following ELC communities: TPO, CUM, and MAM that are a minimum of 30 ha in size with vegetation that is over 30 cm in height with a thick thatch layer and a lack of emergent woody vegetation.	The Henslow's Sparrow breeds in the northeastern and east-central United States, and reaches its northeastern limit in Ontario. It was once fairly common in scattered areas of suitable habitat south of the Canadian Shield. However, steep declines since the 1960s have all but wiped this bird out as a breeding species in Ontario. A few are still seen each spring at migration hotspots such as Point Pelee National Park, and a few may breed at selected locations.	NHIC
Amphibians	Jefferson Salamander <i>Ambystoma jeffersonianum</i>	END	END Schedule 1	END	- Adults live in moist, loose soil, under logs or in leaf litter. Your best chance of spotting a Jefferson salamander is in early spring when they travel to woodland ponds to breed. They lay their eggs in clumps attached to underwater vegetation. By midsummer, the larvae lose their gills and leave the pond and head into the surrounding forest. Once in the forest, Jefferson salamanders spend much of their time underground in rodent burrows, and under rocks and stumps. They feed primarily on insects and worms. - This species can be associated with the following ELC code: FOD where permanent or temporary ponds or pools are present.	In Canada, it is found only in southern Ontario, mainly along the Niagara Escarpment.	NHIC
Amphibians	Unisexual Ambystoma (Jefferson Salamander dependent population) <i>Ambystoma laterale</i> -(2) <i>jeffersonianum</i>	END	No Status	END	- Unisexual Ambystoma salamanders live in leaf litter, under logs, and in underground cavities in deciduous and mixed forests, typically within close proximity to breeding habitats. Adults breed in vernal pools (temporary woodland ponds) or fish-free permanent wetlands. They lay their eggs in clumps attached to underwater vegetation in shallow water. The eggs hatch into aquatic larvae after about one month, and the larvae transform into juveniles by the end of summer. The juveniles leave the pond and head into the surrounding forest. Unisexual Ambystoma salamanders spend the winter underground where they can get below the frost line and avoid freezing temperatures, such as in mammal burrows, rock crevices, or other underground cavities. Although these salamanders spend much of the year underground or under cover, they can often be observed in early spring when they travel to breeding sites. - Unisexual salamanders have the same habitat requirements as their respective sperm-donating species. They are normally found within deciduous or mixed forests containing, or adjacent to, suitable breeding ponds. Breeding ponds are normally ephemeral, or vernal, pools that dry in late summer. Terrestrial habitat is in moist woodlands, where the salamanders find shelter from predators and desiccation under fallen trees or rocks, as well as in mammal burrows. Adults forage during humid conditions at night on the forest floor within ~1 km of the breeding pond. These salamanders also require terrestrial overwintering sites below the frost line.	- In Canada, the Unisexual Ambystoma (Jefferson Salamander dependent population) salamanders are restricted to southern Ontario, mainly along the Niagara Escarpment. - Unisexual salamanders are found in association with appropriate bisexual species whose males serve as sperm donors. The geographic range of unisexual salamanders in the genus <i>Ambystoma</i> roughly coincides with deciduous and mixed-wood forests in northeastern North America from Nova Scotia and the New England States to Indiana. Their northern limits are in Minnesota, north-central Ontario, and southern Quebec, and they range south to Kentucky. In Canada, unisexual salamanders are found in association with the Jefferson Salamander in Ontario. In Canada, unisexual populations of salamanders occur in all known Jefferson Salamander populations.	NHIC

Attachment B. Guelph Water Supply Master Plan Updated Study, Species at Risk Habitat Screening

Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat	Known Species Range	Source Identifying Species Record
Mammals	Little Brown Myotis (Little Brown Bat) <i>Myotis lucifugus</i>	END	END Schedule 1	END	■ Bats are nocturnal. During the day they roost in trees and buildings. They often select attics, abandoned buildings, and barns for summer colonies where they can raise their young. Bats can squeeze through very tiny spaces (as small as six millimetres across) and this is how they access many roosting areas. Little Brown Bats hibernate from October or November to March or April, most often in caves or abandoned mines that are humid and remain above freezing. ■ Their specific physiological requirements limit the number of suitable sites for overwintering. In the east, large numbers (i.e., >3000 bats) of several species typically overwinter in relatively few hibernacula. In the west, there are fewer known hibernacula, and numbers appear lower per site. Females establish summer maternity colonies, often in buildings or large-diameter trees. Foraging occurs over water, along waterways, and forest edges. Large open fields or clearcuts generally are avoided. In autumn, bats return to hibernacula, which may be hundreds of kilometres from their summering areas, swarm near the entrance, mate, and then enter that hibernaculum, or travel to different hibernacula to overwinter.	■ The Little Brown Bat is widespread in southern Ontario and found as far north as Moose Factory and Favourable Lake. ■ In Canada, <i>Myotis lucifugus</i> occurs from Newfoundland to British Columbia, and northward to near the treeline in Labrador, Northwest Territories and Yukon.	■ Dobbyn, 1994
Birds	Loggerhead Shrike <i>Lanius ludovicianus</i>	END	END Schedule 1	END	■ In Ontario, the Loggerhead Shrike prefers pasture or other grasslands with scattered low trees and shrubs. It lives in fields or alvars (areas of exposed bedrock) with short grass, which makes it easier to spot prey. It builds its nest in small trees or shrubs and hunts by waiting patiently in tree branches until it swoops down and attacks its unsuspecting prey – usually large insects, such as grasshoppers. Loggerhead Shrikes also require spiny, multi-branched shrubs where they can impale prey before eating it. Barbed wired fencing can also be used for this. ■ This species can typically be associated with the following ELC communities: SWT, CUM, CUT, ALO and ALS.	■ The Loggerhead Shrike currently breeds in central and western North America. Until the 1970s, the Loggerhead Shrike could be found at many locations throughout southern Ontario and other parts of northeastern North America, but it has declined dramatically. Although the occasional bird is still found within the broader former range, most remaining Loggerhead Shrikes are now found in two core grassland habitats - the Carden Plain north of Lindsay, and the Napanee Limestone Plain. Every fall these birds migrate to the southern United States for the winter.	■ NHIC
Mammals	Northern Myotis (Northern Long-eared Bat) <i>Myotis septentrionalis</i>	END	END Schedule 1	END	■ Northern Long-eared Bats are associated with boreal forests, choosing to roost under loose bark and in the cavities of trees. These bats hibernate from October or November to March or April. ■ The Northern Long-eared Bat overwinters in cold and humid hibernacula (caves/mines). Their specific physiological requirements limit the number of suitable sites for overwintering. In the east, large numbers (i.e., >3000 bats) of several species typically overwinter in relatively few hibernacula. In the west, there are fewer known hibernacula, and numbers appear lower per site. Females establish summer maternity colonies in buildings or large-diameter trees. Foraging occurs along waterways, forest edges, and in gaps in the forest. Large open fields or clearcuts generally are avoided. In autumn, bats return to hibernacula, which may be hundreds of kilometres from their summering areas, swarm near the entrance, mate, and then enter that hibernaculum, or travel to different hibernacula to overwinter.	■ The Northern Long-eared Bat is found throughout forested areas in southern Ontario, to the north shore of Lake Superior and occasionally as far north as Moosonee, and west to Lake Nipigon. ■ In Canada, <i>Myotis septentrionalis</i> occurs from Newfoundland to British Columbia, and northward to near the treeline in Labrador, Northwest Territories, and Yukon.	■ Dobbyn, 1994
Birds	Prothonotary Warbler <i>Protonotaria citrea</i>	END	END Schedule 1	END	■ The Prothonotary is the only warbler in eastern North America that nests in tree cavities, where it typically lays four to six eggs on a cushion of moss, leaves, and plant fibres. ■ In Canada, this species breeds only in deciduous swamp forests or riparian floodplain forests. The forests it occupies are typically dominated by Silver Maple, ash, and Yellow Birch. The species nests in naturally formed tree cavities or cavities excavated by other species, mainly Downy Woodpeckers and chickadees. It favours small, shallow holes situated at low heights in dead or dying trees, in which it builds a nest lined with moss. Nests are typically situated over standing or slow-moving water. Artificial nest boxes are also readily accepted and perhaps even preferred. Males often build one or more incomplete “dummy” nests. Females usually select one of these to complete, but they may also build an entirely new nest on their own. In any case, several suitable cavities appear to be required in each territory to accommodate all of these nests.	■ In Canada, the Prothonotary Warbler is only known to nest in southwestern Ontario, primarily along the north shore of Lake Erie. Over half of the small and declining population is found in Rondeau Provincial Park. In Ontario, the Prothonotary Warbler is found in the warmer climate of the Carolinian deciduous forests. ■ This species is very rare in Canada, but is actively monitored by a combination of amateurs and professionals. Many occupied sites are prone to blinking on and off. This level of annual fluctuation makes it difficult to ascertain whether there has been a true change in occupied range, but such a change seems unlikely. Fewer than 10 locations are occupied in Canada in any given year (e.g., no more than 8 in 2015).	■ eBird

Attachment B. Guelph Water Supply Master Plan Updated Study, Species at Risk Habitat Screening

Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat	Known Species Range	Source Identifying Species Record
Fish	Redside Dace <i>Clinostomus elongatus</i>	END	END Schedule 1	END	■ The Redside Dace is found in pools and slow-moving areas of small streams and headwaters with a gravel bottom. They are generally found in areas with overhanging grasses and shrubs, and can leap up to 10 cm out of the water to catch insects. During spawning, they can be found in shallow parts of streams, which are also popular spawning areas for other minnow species. ■ This species can be associated with the following ELC communities: OAO, SA stream communities with gravel substrates and overhanging grasses and shrubs.	■ In Canada, Redside Dace are found in a few tributaries of Lake Huron, in streams flowing into western Lake Ontario, the Holland River (which flows into Lake Simcoe), and Irvine Creek of the Grand River system (which flows into Lake Erie).	■ NHIC
Insects	Gypsy Cuckoo Bumble Bee <i>Bombus bohemicus</i>	END	END Schedule 1	END	■ The Gypsy Cuckoo Bumble Bee is a holarctic species known to occur around the globe in Europe, Asia, and North America. In Canada, the Gypsy Cuckoo Bumble Bee has been recorded in every province and territory except Nunavut and occurs in diverse habitats such as open meadows, agricultural and urban areas, boreal forest, and woodlands. This bumble bee is thought to eat the pollen and nectar of a wide variety of plants. Gypsy Cuckoo Bumble Bees are a parasitic species which follows the life cycle pattern and therefore, in part, the habitat of its hosts which are other bumble bees (e.g., the Rusty-patched and Yellow-banded Bumble Bees). ■ Gypsy Cuckoo Bumble Bee occurs in diverse habitats, including open meadows, mixed farmlands, urban areas, boreal forest, and montane meadows. The species feeds on pollen and nectar from a variety of plant genera. Gypsy Cuckoo Bumble Bee emerges slightly later than host queens, and parasitizes host nests in the spring. Host nests occur in abandoned underground rodent burrows and rotten logs.	■ In Ontario, the Gypsy Cuckoo Bumble Bee was historically found throughout most of the province; however in recent years it is known only to occur in Pinery Provincial Park. Despite recent search effort, few Gypsy Cuckoo Bumble Bees have been observed in the last 20 years in Ontario. Due to its decline across Canada, it is now only known to occur in three provinces based on evidence from recent survey efforts. ■ In Canada, Gypsy Cuckoo Bumble Bee has been recorded in every province and territory except Nunavut. Canadian records are from 1883 to 2008, the most recent records being from Pinery Provincial Park in Ontario (2008) and Parc national des Monts-Valin in Quebec (2008). Since 1991, the species has only been recorded from three provinces: Ontario (67 specimens), Quebec (39 specimens) and Nova Scotia (18 specimens). The species distribution is partially determined by the distribution and abundance of its host bumble bee species. Recent surveys at historically occupied sites have recorded no specimens. The species has not been recorded at many sites surveyed within the last four decades, even where its hosts remain present.	■ NHIC
Insects	Nine-spotted Lady Beetle <i>Coccinella novemnotata</i>	END	No Status	END	■ The Nine-spotted Lady Beetle is able to live in a wide variety of areas including agricultural areas, suburban gardens, parks, coniferous forests, deciduous forests, prairie grasslands, meadows, riparian areas, and isolated natural areas. ■ Nine-spotted Lady Beetles are habitat generalists, known to consume a wide variety of prey across a wide range of habitats. This broad habitat range reflects their ability to exploit seasonal changes in prey availability across different vegetation types.	■ Nine-spotted Lady Beetle was once found throughout southern Ontario and as far north as the eastern shores of Lake Superior. Since the mid-1990s, there have been no records of this species in Ontario. Given the lack of recent records the species may be extirpated, however, it is also possible that individuals or small populations have been overlooked in parts of its range. ■ The Nine-spotted Lady Beetle is a wide-ranging species occurring throughout most of southern Canada with a range that extends along the international border from Vancouver Island to southern Quebec; with northern range limits near: Quesnel, British Columbia; Edmonton, Alberta; Lake Athabasca, Saskatchewan; and Roberval, Quebec.	■ NHIC
Insects	Rusty-patched Bumble Bee <i>Bombus affinis</i>	END	END Schedule 1	END	■ This species, like other bumble bees, can be found in open habitat such as mixed farmland, urban settings, savannah, open woods and sand dunes. The most recent sightings have been in oak savannah, which contains both woodland and grassland flora and fauna. ■ This species can typically be associated with the following ELC communities: CUM, TPO, TPS, TPW, CUS, SDO, SDS and SDT.	■ The Rusty-patched Bumble Bee was once widespread and common in eastern North America, found from southern Ontario south to Georgia and west to the Dakotas. ■ The species has suffered rapid, severe decline throughout its entire range since the 1970s with only a handful of specimens collected in recent years in Ontario. The only sightings of this bee in Canada since 2002 have been at The Pinery Provincial Park on Lake Huron.	■ NHIC

Attachment B. Guelph Water Supply Master Plan Updated Study, Species at Risk Habitat Screening

Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat	Known Species Range	Source Identifying Species Record
Mammals	Tri-colored Bat <i>Perimyotis subflavus</i>	END	END Schedule 1	END	■ During the summer, the Tri-colored Bat is found in a variety of forested habitats. It forms day roosts and maternity colonies in older forest and occasionally in barns or other structures. They forage over water and along streams in the forest. Tri-colored Bats eat flying insects and spiders gleaned from webs. At the end of the summer they travel to a location where they swarm; it is generally near the cave or underground location where they will overwinter. They overwinter in caves where they typically roost by themselves rather than part of a group. ■ The Tri-colored Bat overwinters in cold and humid hibernacula (caves/mines). Their specific physiological requirements limit the number of suitable sites for overwintering. In the east, large numbers (i.e., >3000 bats) of several species typically overwinter in relatively few hibernacula. In the west, there are fewer known hibernacula, and numbers appear lower per site. Females establish summer maternity colonies in buildings or large-diameter trees. Foraging occurs over water, along waterways, and forest edges. Large open fields or clearcuts generally are avoided. In autumn, bats return to hibernacula, which may be hundreds of kilometres from their summering areas, swarm near the entrance, mate, and then enter that hibernaculum, or travel to different hibernacula to overwinter.	■ This bat is found in southern Ontario and as far north as Espanola near Sudbury. Because it is very rare, it has a scattered distribution. It is also found from eastern North America down to Central America. ■ In Canada, <i>Perimyotis subflavus</i> occurs in Nova Scotia, New Brunswick, Quebec, and Ontario.	■ Dobbyn, 1994
Birds	Yellow-breasted Chat <i>Icteria virens</i>	END	END Schedule 1	END	■ The Yellow-breasted Chat lives in thickets and scrub, especially locations where clearings have become overgrown. These birds spend their winters in coastal marshes. ■ This species can typically be associated with the following ELC communities: CUW and CUT.	■ The Yellow-breasted Chat is found in much of the United States. In Canada, it lives in southern British Columbia, the Prairies, and southwestern Ontario, where it is concentrated in Point Pelee National Park and Pelee Island in Lake Erie.	■ NHIC
Birds	Barn Swallow <i>Hirundo rustica</i>	THR	THR	THR	■ Barn Swallows often live in close association with humans, building their cup-shaped mud nests almost exclusively on human-made structures such as open barns, under bridges and in culverts. The species is attracted to open structures that include ledges where they can build their nests, which are often re-used from year to year. They prefer unpainted, rough-cut wood, since the mud does not adhere as well to smooth surfaces. ■ This species can typically be associated with the following ELC communities: TPO, CUM1, MAM, MAS, OAO, SAS1, SAM1, SAF1; containing or adjacent structures that are suitable for nesting.	■ The Barn Swallow may be found throughout southern Ontario and can range as far north as Hudson Bay, wherever suitable locations for nests exist.	■ NHIC, Ontario Breeding Bird Atlas ■ Wellington Squares 17NJ51, 17NJ52, 17NJ61, 17NJ62 Species List, iNaturalist 2020, eBird
Birds	Bank Swallow <i>Riparia riparia</i>	THR	THR Schedule 1	THR	■ Bank Swallows nest in burrows in natural and human-made settings where there are vertical faces in silt and sand deposits. Many nests are on banks of rivers and lakes, but they are also found in active sand and gravel pits or former ones where the banks remain suitable. The birds breed in colonies ranging from several to a few thousand pairs. ■ The Bank Swallow breeds in a wide variety of natural and artificial sites with vertical banks, including riverbanks, lake and ocean bluffs, aggregate pits, road cuts, and stock piles of soil. Sand-silt substrates are preferred for excavating nest burrows. Breeding sites tend to be somewhat ephemeral due to the dynamic nature of bank erosion. Breeding sites are often situated near open terrestrial habitat used for aerial foraging (e.g., grasslands, meadows, pastures, and agricultural cropland). Large wetlands are used as communal nocturnal roost sites during post-breeding, migration, and wintering periods.	■ he Bank Swallow is found all across southern Ontario, with sparser populations scattered across northern Ontario. The largest populations are found along the Lake Erie and Lake Ontario shorelines, and the Saugeen River (which flows into Lake Huron). ■ In North America, it breeds widely across the northern two-thirds of the U.S., north to the treeline. It breeds in all Canadian provinces and territories, except perhaps Nunavut.	■ NHIC
Fish	Black Redhorse <i>Moxostoma duquesnei</i>	THR	THR Schedule 1	THR	■ In Ontario, the Black Redhorse lives in pools and riffle areas of medium-sized rivers and streams that are usually less than two metres deep. These rivers usually have few aquatic plants, a moderate to fast current, and a sandy or gravel bottom. In the spring, it migrates to breeding habitat where eggs are laid on gravel in fast water. The winter is spent in deeper pools. Adults feed on crustaceans and aquatic insects, while the young fish feed on plankton. ■ This species can typically be associated with the following ELC communities: SA and OAO; in pools and riffles of medium sized rivers and streams less than two meters in depth with few aquatic plants, a moderate to fast current and a sandy or gravel bottom.	■ In Canada, the Black Redhorse is found only in southwestern Ontario at a few locations in the Bayfield River, Maitland River, Ausable River, Grand River, Thames River, and Spencer Creek watersheds.	■ NHIC

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Reptiles	Blanding's Turtle <i>Emydoidea blandingii</i>	THR	THR Schedule 1	THR	■ Blanding's Turtles live in shallow water, usually in large wetlands and shallow lakes with lots of water plants. It is not unusual, though, to find them hundreds of metres from the nearest water body, especially while they are searching for a mate or traveling to a nesting site. Blanding's Turtles hibernate in the mud at the bottom of permanent water bodies from late October until the end of April. ■ This species can typically be associated with the following ELC communities: SWT2, SWT3, SWD, SWM, MAS2, SAS1, SAM1, where open water is present.	■ The Blanding's Turtle is found in and around the Great Lakes Basin, with isolated populations elsewhere in the United States and Canada. In Canada, the Blanding's Turtle is separated into the Great Lakes-St. Lawrence population and the Nova Scotia population. Blanding's Turtles can be found throughout southern, central and eastern Ontario.	■ NHIC, ORAA
Birds	Bobolink <i>Dolichonyx oryzivorus</i>	THR	THR Schedule 1	THR	■ Historically, Bobolinks lived in North American tallgrass prairie and other open meadows. With the clearing of native prairies, Bobolinks moved to living in hayfields. Bobolinks often build their small nests on the ground in dense grasses. ■ Both parents usually tend to their young, sometimes with a third Bobolink helping. ■ This species can typically be associated with the following ELC communities: TPO, TPS, CUM1 and MAM2.	■ The Bobolink breeds across North America. In Ontario, it is widely distributed throughout most of the province south of the boreal forest, although it may be found in the north where suitable habitat exists.	■ NHIC, Ontario Breeding Bird Atlas ■ Wellington Squares 17NJ51, 17NJ52, 17NJ61, 17NJ62 Species List, eBird
Birds	Cerulean Warbler <i>Setophaga cerulea</i>	THR	END Schedule 1	END	■ Cerulean Warblers spend their summers (breeding seasons) in mature, deciduous forests with large, tall trees and an open understorey. ■ They are found in both wet bottomland forests and upland areas. At a finer spatial scale, canopy configuration (e.g., foliage stratification, gap distribution, tree species distribution) are predictors of habitat suitability.	■ The Cerulean Warbler's breeding range extends from extreme southwestern Quebec and southern Ontario west to Minnesota and Nebraska and south to Texas and other Gulf states across to North Carolina. In southern Ontario, populations appear to be separated into two distinct bands: one from southern Lake Huron to western Lake Ontario, and further north, the other from the Bruce Peninsula and Georgian Bay area to the Ottawa River. ■ This species breeds in the deciduous forests of eastern North America but has a patchy distribution. The Canadian breeding range consists of two main geographic clusters in southwestern and southeastern Ontario, plus a small number of breeding individuals in southwestern Quebec.	■ NHIC
Birds	Chimney swift <i>Chaetura pelagica</i>	THR	THR Schedule 1	THR	■ Before European settlement Chimney Swifts mainly nested on cave walls and in hollow trees or tree cavities in old growth forests. Today, they are more likely to be found in and around urban settlements where they nest and roost (rest or sleep) in chimneys and other manmade structures. They also tend to stay close to water as this is where the flying insects they eat congregate. ■ Foraging habitat for this species can be associated with the following ELC codes: TPO, CUM1, MAM, MAS, OAO, SAS1, SAM1, SAF1 containing or adjacent structures with suitable nesting habitat (i.e. chimneys).	■ The Chimney Swift breeds in eastern North America, possibly as far north as southern Newfoundland. In Ontario, it is most widely distributed in the Carolinian zone in the south and southwest of the province, but has been detected throughout most of the province south of the 49th parallel. It winters in northwestern South America.	■ Ontario Breeding Bird Atlas ■ Wellington Squares 17NJ51, 17NJ52, 17NJ61, 17NJ62 Species List, iNaturalist 2020, ebird
Birds	Eastern Meadowlark <i>Sturnella magna</i>	THR	THR Schedule 1	THR	■ Eastern Meadowlarks breed primarily in moderately tall grasslands, such as pastures and hayfields, but are also found in alfalfa fields, weedy borders of croplands, roadsides, orchards, airports, shrubby overgrown fields, or other open areas. ■ Small trees, shrubs or fence posts are used as elevated song perches. ■ This species can typically be associated with the following ELC communities: TPO, TPS, CUM1, CUS, MAM2 and MAS2 with elevated song perches.	■ In Ontario, the Eastern Meadowlark is primarily found south of the Canadian Shield but it also inhabits the Lake Nipissing, Timiskaming and Lake of the Woods areas.	■ NHIC, Ontario Breeding Bird Atlas ■ Wellington Squares 17NJ51, 17NJ52, 17NJ61, 17NJ62 Species List, iNaturalist 2020, eBird
Birds	Least Bittern <i>Ixobrychus exilis</i>	THR	THR Schedule 1	THR	■ In Ontario, the Least Bittern is found in a variety of wetland habitats, but strongly prefers cattail marshes with a mix of open pools and channels. This bird builds its nest above the marsh water in stands of dense vegetation, hidden among the cattails. The nests are almost always built near open water, which is needed for foraging. This species eats mostly frogs, small fish, and aquatic insects. ■ This species can typically be associated with the following ELC communities: MAS2-1, MAS3-1, SA and OAO.	■ In Ontario, the Least Bittern is mostly found south of the Canadian Shield, especially in the central and eastern part of the province. Small numbers also breed occasionally in northwest Ontario. This species has disappeared from much of its former range, especially in southwestern Ontario, where wetland loss has been most severe. In winter, Least Bitterns migrate to the southern United States, Mexico and Central America.	■ NHIC, Ontario Breeding Bird Atlas ■ Wellington Squares 17NJ51, 17NJ52, 17NJ61, 17NJ62 Species List, iNaturalist 2020

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Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat	Known Species Range	Source Identifying Species Record
Fish	Silver Shiner <i>Notropis photogenis</i>	THR	THR Schedule 1	THR	■ Silver Shiners prefer moderate to large size streams with swift currents that are free of weeds and have clean gravel or boulder bottoms. They live in schools and feed on crustaceans and adult flies that fall in the water or fly just above the surface. In June or July, they spawn by scattering their eggs over gravel riffles. ■ This species can typically be associated with the following ELC communities: OAO characterized as moderate to large streams with swift currents, no weeds and gravel or boulder substrates.	■ The Silver Shiner range includes east-central North America throughout the Ohio and Tennessee River drainage basins. In Ontario, it is found in the Thames and Grand Rivers, and in Bronte Creek and Sixteen Mile Creek, which flow into Lake Ontario.	■ NHIC
Plants	Blue Ash <i>Fraxinus quadrangulata</i>	THR	SC Schedule 1	THR	■ In Ontario, Blue Ash grows in deciduous floodplain forests, and along sandy beaches and on limestone outcrops associated with Lake Erie. ■ Blue Ash grows in a variety of habitats and soil types. In Ontario, it is found in three distinctive habitat types. They include floodplains and river valleys where Blue Ash grows in rich soils in association with a variety of other tree species; shallow soils on alvar and limestone on the Lake Erie Islands; and stabilized beaches at Point Pelee National Park, and Fish Point on Pelee Island. All of these habitats have declined in area and quality over the last 100 years. While the effects of habitat fragmentation on Blue Ash have not been assessed, it is expected that fragmentation will result in ecological degradation and perhaps genetic degradation over a longer timeframe, which may contribute to decreasing the likelihood of persistence of subpopulations.	■ The range of Blue Ash extends from southwestern Ontario south to Oklahoma and Georgia. In Canada, it occurs only in southwestern Ontario, at the northern limits of its range, where about 56 occurrences are known. ■ Blue Ash has a restricted distribution in Canada and occurs only in southwestern Ontario in the counties and municipalities of Elgin, Middlesex, Lambton, Chatham-Kent, and Essex. It is found at Point Pelee, Peche Island at the mouth of the Detroit River, and the Erie Islands, as well as in river valleys along the Thames River, Sydenham River, and Catfish Creek.	■ iNaturalist, 2021
Plants	Goldenseal <i>Hydrastis canadensis</i>	THR	THR Schedule 1	SC	■ Goldenseal grows in rich, moist semi-open to closed areas of deciduous forests. It is found at periodically flooded upland sites and in moist lowlands near floodplains. It is associated with Red Oak, Sugar Maple, Hawthorns, Shagbark Hickory, Ironwood, and Basswood. The species typically grows in disturbed areas where trees have fallen, or next to recreational paths or woodland edges. It prefers sandy loam, loam soils, or clay soils depending on whether it is growing in an upland or lowland area. ■ Goldenseal grows in rich moist areas of deciduous forests dominated by Sugar Maple, or in moist floodplain forests dominated by Red Maples and White Oaks. In Ontario it occurs in the western portion of the Mixedwood Plains ecozone	■ Goldenseal is widespread, but rare, throughout its eastern North American range, which extends from southern Ontario and New England south to Georgia and Arkansas and west to Kansas and Oklahoma. In Canada, it is found only in extreme southwestern Ontario in the Carolinian Zone. ■ In Canada it occurs only in extreme southwestern Ontario in the western portion of the Mixedwood Plains ecozone. It still occurs in this small and heavily populated part of Canada, though its numbers began to decline during the late 1800s.	■ iNaturalist, 2019
Birds	Eastern Whip-poor-will <i>Antrostomus vociferus</i>	THR	THR Schedule 1	THR	■ The Eastern Whip-poor-will is usually found in areas with a mix of open and forested areas, such as savannahs, open woodlands, or openings in more mature deciduous, coniferous, and mixed forests. It forages in these open areas and uses forested areas for roosting (resting and sleeping) and nesting. It lays its eggs directly on the forest floor, where its colouring means it will easily remain undetected by visual predators. ■ Whip-poor-will breeding habitat is not dependent upon species composition, but rather on forest structure, although common tree associations in both summer and winter are pine and oak. The species shuns both wide-open spaces and dense forest. It prefers to nest in semi-open forests or patchy forests with clearings, such as barrens or forests that are regenerating following major disturbances. Other necessary breeding habitat elements are thought to involve ground-level vegetation and woodland size. Individuals will often feed in nearby shrubby pastures or wetlands with perches. Areas with decreased light levels where forest canopies are closed are generally not occupied, perhaps because of reduced forage success for this aerial-feeding insectivore.	■ The Eastern Whip-poor-will's breeding range includes two widely separate areas. It breeds throughout much of eastern North America, reaching as far north as southern Canada. In Ontario they breed as far north as the shore of Lake Superior. ■ Although Eastern Whip-poor-wills were once widespread throughout the central Great Lakes region of Ontario, their distribution in this area is now fragmented.	■ eBird

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Birds	Bald Eagle <i>Haliaeetus leucocephalus</i>	SC	No Status	Not at Risk	■ Bald Eagles nest in a variety of habitats and forest types, almost always near a major lake or river where they do most of their hunting. While fish are their main source of food, Bald Eagles can easily catch prey up to the size of ducks, and frequently feed on dead animals, including White-tailed Deer. They usually nest in large trees such as pine and poplar. ■ During the winter, Bald Eagles sometimes congregate near open water such as the St. Lawrence River, or in places with a high deer population where carcasses might be found. ■ This species can typically be associated with the following ELC communities: FOC, FOM, FOD, SWC, SWM and SWD. Nests typically located near major bodies of water.	■ Bald Eagles are widely distributed throughout North America. In Ontario, they nest throughout the north, with the highest density in the northwest near Lake of the Woods. Historically they were also relatively common in southern Ontario, especially along the shore of Lake Erie, but this population was all but wiped out 50 years ago. After an intensive re-introduction program and environmental clean-up efforts, the species has rebounded and can once again be seen in much of its former southern Ontario range.	■ NHIC, eBird
Birds	Black Tern <i>Chlidonias niger</i>	SC	No Status	Not at Risk	■ Black Terns build floating nests in loose colonies in shallow marshes, especially in cattails. In winter they migrate to the coast of northern South America. ■ Nesting habitat for this species can be associated with the following ELC communities: MAS2-1 and OAO. These two communities must be present immediately adjacent each other and with sufficient water to provide suitable habitat.	■ In Ontario, Black Terns are found scattered throughout the province, but breed mainly in the marshes along the edges of the Great Lakes.	■ NHIC
Birds	Canada Warbler <i>Wilsonia canadensis</i>	SC	THR Schedule 1	THR	■ The Canada Warbler breeds in a range of deciduous and coniferous, usually wet forest types, all with a well- developed, dense shrub layer. Dense shrub and understory vegetation help conceal Canada Warbler nests that are usually located on or near the ground on mossy logs or roots, along stream banks or on hummocks. ■ This species can typically be associated with the following ELC communities: FOC3, FOC4, FOM6, FOM7, FOM8, FOD6, FOD7, FOD8, FOD9, SWC, SWM and SWD with a well-developed shrub layer.	■ The Canada Warbler only breeds in North America and 80 per cent of its known breeding range is in Canada. Its primary breeding range is in the Boreal Shield, extending north into the Hudson Plains and south into the Mixedwood Plains. Although the Canada Warbler breeds at low densities across its range, in Ontario, it is most abundant along the Southern Shield.	■ Ontario Breeding Bird Atlas ■ Wellington Squares 17NJ51, 17NJ52, 17NJ61, 17NJ62 Species List, iNaturalist 2020, eBird
Birds	Common Nighthawk <i>Chordeiles minor</i>	SC	THR Schedule 1	SC	■ Traditional Common Nighthawk habitat consists of open areas with little to no ground vegetation, such as logged or burned-over areas, forest clearings, rock barrens, peat bogs, lakeshores, and mine tailings. Although the species also nests in cultivated fields, orchards, urban parks, mine tailings and along gravel roads and railways, they tend to occupy natural sites. ■ This species can typically be associated with the following ELC communities: SD, BB, RB, CUM, BO, FOM, FOC and FOD with openings with little vegetation.	■ The range of the Common Nighthawk spans most of North and Central America. In Canada, the species is found in all provinces and territories except Nunavut. In Ontario, the Common Nighthawk occurs throughout the province except for the coastal regions of James Bay and Hudson Bay. It winters in South America where it is concentrated in Peru, Ecuador and Brazil.	■ Ontario Breeding Bird Atlas ■ Wellington Squares 17NJ51, 17NJ52, 17NJ61, 17NJ62 Species List
Reptiles	Eastern Ribbonsnake <i>Thamnophis sauritus</i>	SC	SC Schedule 1	SC	■ The Eastern Ribbonsnake is usually found close to water, especially in marshes, where it hunts for frogs and small fish. A good swimmer, it will dive in shallow water, especially if it is fleeing from a potential predator. At the onset of cold weather, these snakes congregate in underground burrows or rock crevices to hibernate together. ■ This species can typically be associated with the following ELC communities: FOC, FOM, FOD, SWC, SWM, SWD, MAM, MAS, OAO, SAS, SAM and SAF containing or near year round standing or flowing water.	■ The Eastern Ribbon Snake is found from southern Ontario west to Michigan and Wisconsin (isolated pockets), south to Illinois and Ohio, and east to New York State and Nova Scotia, where there is an isolated population. In Ontario, this snake occurs throughout southern and eastern Ontario and is locally common in parts of the Bruce Peninsula, Georgian Bay and eastern Ontario.	■ NHIC, ORAA
Birds	Golden-winged Warbler <i>Vermivora chrysoptera</i>	SC	THR Schedule 1	THR	■ Golden-winged Warblers prefer to nest in areas with young shrubs surrounded by mature forest – locations that have recently been disturbed, such as field edges, hydro or utility right-of-ways, or logged areas. ■ In their breeding areas, Golden-winged Warblers seem to be fond of regeneration zones where young shrubs grow, surrounded by mature forest, and characterized by plant succession of 10 to 30 years. The warblers frequent clusters of herbaceous plants and low bushes (where they place their nests, which are built on the ground). They favour environments where the trees are spread out, as well as the forest edge, and use this setting for perching, singing, and looking for food. Golden-winged Warblers are found in dry uplands, swamp forests, and marshes. This warbler shows a preference for beaver ponds and burned-out or intermittently cultivated areas.	■ The Golden-winged Warbler is found in southern Saskatchewan, Manitoba, Ontario, and Quebec, as well as the north-eastern United States. In Ontario, these birds breed in central-eastern Ontario, as far south as Lake Ontario and the St. Lawrence River, and as far north as the northern edge of Georgian Bay. Golden-winged Warblers have also been found in the Lake of the Woods area near the Manitoba border, and around Long Point on Lake Erie. ■ Golden-winged Warblers nest primarily in the northeastern United States, southeastern Saskatchewan, southwestern Manitoba, southwestern Ontario and far southwestern Quebec. In Ontario, they breed from the far southwest of the province north as far as the centre of the Nipissing region, the southern part of the Sudbury and Algoma districts, and the southwest part of the Rainy River district, near Lake of the Woods.	■ eBird

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Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat	Known Species Range	Source Identifying Species Record
Birds	Grasshopper Sparrow <i>Ammodramus savannarum</i> Grasshopper Sparrow (pratensis subspecies; Eastern Grasshopper Sparrow) <i>Ammodramus savannarum pratensis</i>	SC	SC Schedule 1	SC	■ It lives in open grassland areas with well-drained, sandy soil. It will also nest in hayfields and pasture, as well as alvars, prairies, and occasionally grain crops such as barley. It prefers areas that are sparsely vegetated. Its nests are well-hidden in the field and woven from grasses in a small cup-like shape. The Grasshopper Sparrow is a short-distance migrant and leaves Ontario in the fall to migrate to the southeastern United States and Central America for the winter. ■ In Canada, the Eastern Grasshopper Sparrow typically breeds in large human-created grasslands (5 ha or greater), such as pastures and hayfields, and natural prairies, such as alvars, characterized by well-drained, often poor soil dominated by relatively low, sparse perennial herbaceous vegetation.	■ The Grasshopper Sparrow can be found throughout southern Ontario, but only occasionally on the Canadian Shield. It is most common where grasslands, hay, or pasture dominate the landscape. ■ In Canada, the breeding range of the Eastern Grasshopper Sparrow includes extreme southern Québec and southern Ontario, with the vast majority of birds occurring in Ontario.	■ eBird
Plants	Hart's-tongue Fern <i>Asplenium scolopendrium americanum</i>	SC	THR Schedule 1	No Status	■ Hart's-tongue Fern grows on calcareous rocks in deep shade on slopes in deciduous forest. Most Ontario occurrences are in maple-beech forest. Established plants can grow in exposed, rocky crevices and on outcrops, but moist, mossy areas seem to be essential for spore germination and early plant development. ■ This species can typically be associated with the following ELC communities: FOD and FOD5-2 with exposed calcareous rock.	■ Hart's-tongue Ferns are found at sites in New York, Michigan, Tennessee, Alabama, Ontario, Oaxaca, Chiapas and Hispaniola. Ontario has the bulk of populations north of Mexico. In this province the fern has been reported at more than 100 sites, mostly on the Niagara Escarpment, with about 75 of these believed to still exist.	■ NHIC
Plants	Hill's Pondweed <i>Potamogeton hillii</i>	SC	SC Schedule 1	SC	■ Hill's Pondweed is found in slow-moving streams, ditches, ponds, lakes and wetlands. It grows in clear, cold alkaline waters. ■ This species can typically be associated with the following ELC communities: SA and OAO that clear, cold, slow flowing and alkaline.	■ Hill's Pondweed grows in northeastern United States and Ontario, ranging from Wisconsin, Michigan and Ontario south to south-central Pennsylvania and western Virginia, and east to Vermont, Massachusetts and Connecticut. In Ontario, it has been recorded at 26 sites in the Bruce Peninsula, Manitoulin Island, Wellington County and Peel Region. Only about 14 of these are presumed to still support Hill's Pondweed.	■ NHIC
Birds	Horned Grebe (Western population) <i>Podiceps auritus</i>	SC	SC Schedule 1	SC	■ The Horned Grebe usually nests in small ponds, marshes, and shallow bays that contain areas of open water and emergent vegetation. Nests are usually located within a few metres of open water. The Horned Grebe occupies natural habitat more often than man-made reservoirs and artificial ponds. ■ The Horned Grebe breeds primarily in temperate zones such as the Prairies and Parkland Canada, but can also be found in more boreal and subarctic zones. It generally breeds in freshwater and occasionally in brackish water on small semi-permanent or permanent ponds, but it also uses marshes and shallow bays on lake borders. Breeding areas require open water rich in emerging vegetation, which provides nest materials, concealment and anchorage, and protection for the young.	■ The Horned Grebe is found across North America. Most of its North American breeding range is located in Canada, extending from northwestern Ontario to British Columbia and north to Alaska (Western population). The Horned Grebe is a rare breeder in Ontario. Following the breeding season, most individuals migrate from inland freshwater nesting sites to coastal marine sites, although some individuals overwinter on large bodies of freshwater. ■ It breeds in British Columbia, Yukon, the Mackenzie River Valley in the Northwest Territories, the extreme southern part of Nunavut, all of the Prairies, northwestern Ontario, and the Magdalen Islands (Quebec), where a small isolated population has been breeding for at least a century. Most of the North American population winters along the coasts of the continent.	■ iNaturalist, 2020
Reptiles	Milksnake <i>Lampropeltis triangulum</i>	No Status	SC Schedule 1	SC	■ The Milksnake can be found in a range of habitats including rocky outcrops, fields and forest edges. In southern Ontario, it is often found in old farm fields and farm buildings where there is an abundance of mice. The Milksnake hibernates underground, in rotting logs or in the foundations of old buildings. ■ This species can be associated with the following ELC communities: BL, TA, AL, RB, TP, CUM, FOC, FOM and FOD.	■ The Milksnake range extends from Quebec and Maine south to Alabama and Georgia, and west to Minnesota and Iowa. In Ontario, it is widespread and locally common in southern Ontario, and can be found as far north as Lake Nipissing and Sault Ste. Marie.	■ NHIC
Reptiles	Northern Map Turtle <i>Graptemys geographica</i>	SC	SC Schedule 1	SC	■ The Northern Map Turtle inhabits rivers and lakeshores where it basks on emergent rocks and fallen trees throughout the spring and summer. In winter, the turtles hibernate on the bottom of deep, slow-moving sections of river. They require high quality water that supports the female's mollusc prey. Their habitat must contain suitable basking sites, such as rocks and deadheads, with an unobstructed view from which a turtle can drop immediately into the water if startled. ■ This species can typically be associated with the following ELC communities: OAO, SA with emergent rocks and fallen trees suitable habitat for prey.	■ Appalachian mountain barrier. There are isolated populations in New Jersey and New York states. In Canada, it is found in southwestern Quebec and southern Ontario. In southern Ontario, it lives primarily on the shores of Georgian Bay, Lake St. Clair, Lake Erie and Lake Ontario, and along larger rivers including the Thames, Grand and Ottawa.	■ NHIC

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Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat	Known Species Range	Source Identifying Species Record
Birds	Olive-sided Flycatcher <i>Contopus cooperi</i>	SC	THR Schedule 1	SC	■ The Olive-sided Flycatcher is most often found along natural forest edges and openings. It will use forests that have been logged or burned if there are ample tall snags and trees to use for foraging perches. Olive-sided Flycatchers' breeding habitat usually consists of coniferous or mixed forest adjacent to rivers or wetlands. In Ontario, Olive-sided Flycatchers commonly nest in conifers such as White and Black Spruce, Jack Pine, and Balsam Fir. ■ The Olive-sided Flycatcher is most often associated with open areas containing tall live trees or snags for perching. These vantage points are required for foraging. This species generally forages from a high, prominent perch from which it sallies forth to intercept flying insects and then returns to the same perch. Open areas may be forest clearings, forest edges located near natural openings (such as rivers or swamps) or human-made openings (such as logged areas), burned forest, or openings within old-growth forest stands; these forests are characterized by mature trees and large numbers of dead trees. There is evidence that the breeding success of birds nesting in harvested habitats is lower than the breeding success of birds nesting in natural openings. In the boreal forest, suitable habitat is more likely to be in or near wetland areas. Although the amount of old-growth forest obviously decreased during the 20th century, the amount of habitat attractive to Olive-sided Flycatchers may have remained more or less constant, since logging operations continue to create openings favoured by these birds. However, recent studies indicate that these sites are less suitable for breeding.	■ The Olive-sided Flycatcher has a broad breeding range across Canada and the western and northeastern United States. Just over half the range is found in Canada, where it breeds in every province and territory except Nunavut. In Ontario, it is widely distributed throughout the central and northern areas of the province.	■ iNaturalist, 2014, eBird
Birds	Acadian Flycatcher <i>Empidonax virescens</i>	END	END Schedule 1	END	■ It is typically found in mature, shady forests with ravines, or in forested swamps with lots of maple and beech trees. The nest is placed near the tip of a lower limb on a tree, and is loosely woven, with strands of plant material hanging down. In Canada, the Acadian Flycatcher nests only in southwestern Ontario, mostly in large forests and forested ravines near the shore of Lake Erie. ■ The Acadian Flycatcher requires large areas of mature undisturbed forest. Most individuals occur in forests more than 40 hectares in size. The species is also considered to be a forest interior species, meaning that it avoids forest edges and build their nests in areas that are more than 100 meters from the forest edge. The bird lives in the understory of woods with a closed canopy. It is often found in well-wooded swamps and ravines. Acadian Flycatchers also occupy dry woods but they usually prefer to hang their nests over water. Throughout the Carolinian Forest region of Ontario, most of the remaining forest patches are very small (less than three hectares) and only an extremely small percentage of them is large enough to meet the species' requirements	■ In Ontario, the Acadian Flycatcher primarily lives in the warmer climate of southern Ontario's Carolinian forests. It needs large, undisturbed forests, often more than 40 hectares in size. It has also been known to nest at a few sites in the Greater Toronto Area but this is unusual. ■ In Canada, the Acadian Flycatcher occurs in very low numbers in the Carolinian area of southern Ontario. The species is thought to have been more widespread and numerous in Canada prior to the clearing of forests in the early 1800s. Today, there is relatively little habitat remaining that is suitable for the species.	■ NHIC
Birds	Peregrine Falcon <i>Falco peregrinus</i> Peregrine Falcon (anatum/tundrius) <i>Falco peregrinus anatum/tundrius</i>	SC	SC Schedule 1	No Status	■ Peregrine Falcons usually nest on tall, steep cliff ledges close to large bodies of water. Although most people associate Peregrine Falcons with rugged wilderness, some of these birds have adapted well to city life. Urban peregrines raise their young on ledges of tall buildings, even in busy downtown areas. Cities offer peregrines a good year-round supply of pigeons and starlings to feed on. ■ The Peregrine Falcon is found in various types of habitats, from Arctic tundra to coastal areas and from prairies to urban centres. It usually nests alone on cliff ledges or crevices, preferably 50 to 200 m in height, but sometimes on the ledges of tall buildings or bridges, always near good foraging areas. Suitable nesting sites are usually dispersed, but can be common locally in some areas. The natural nesting habitat has not changed significantly since the population crash and is still largely available. In addition, structures built by humans in both rural and urban areas provide the Peregrine Falcon with other potential nesting sites. And though urbanization and other land uses have had a significant impact on some areas where they feed, Peregrine Falcons can usually modify their diet based on the prey species present in a given area.	■ The historic North American distribution of the eastern subspecies is east of the Rocky Mountains and south of the tree line. Although Peregrine Falcons now nest in and around Toronto and several other southern Ontario cities, the majority of Ontario's breeding population is found around Lake Superior in northwestern Ontario. ■ The anatum Peregrine Falcon breeds in the interior of Alaska and throughout northern Canada up to southern Greenland, and across continental North America up to northern Mexico. In Canada it is found in all territories and provinces except Prince Edward Island, Nunavut, and the Island of Newfoundland. The tundrius Peregrine Falcon breeds in Alaska and throughout northern Canada up to Greenland. In Canada, it breeds from northern Yukon, the low Arctic islands, northern Northwest Territories, and northern Nunavut up to Baffin Island, Hudson Bay, Ungava, and northern Labrador.	■ iNaturalist, 2020, eBird

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Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat	Known Species Range	Source Identifying Species Record
Birds	Red-headed Woodpecker <i>Melanerpes erythrocephalus</i>	END	THR Schedule 1	END	- The Red-headed Woodpecker lives in open woodland and woodland edges, and is often found in parks, golf courses and cemeteries. These areas typically have many dead trees, which the bird uses for nesting and perching. This woodpecker regularly winters in the United States, moving to locations where it can find sufficient acorns and beechnuts to eat. A few of these birds will stay the winter in woodlands in southern Ontario if there are adequate supplies of nuts. - This species can typically be associated with the following ELC communities: TPS, TPW, CUW, FOD1, FOD2, FOD4-1, FOD6, FOD7, and FOD9 that are open and have an abundance of dead trees.	The Red-headed Woodpecker is found across southern Ontario, where it is widespread but rare. Outside Ontario, it lives in Alberta, Saskatchewan, Manitoba and Quebec, and is relatively common in the United States.	- Ontario Breeding Bird Atlas - Wellington Squares 17NJ51, 17NJ52, 17NJ61, 17NJ62 Species List
Birds	Rusty Blackbird <i>Euphagus carolinus</i>	SC	SC Schedule 1	SC	- During the winter, it is found in wet woodlands, swamps, and pond edges and often forages in agricultural lands. - The breeding range of the Rusty Blackbird in Canada is almost entirely within the boreal forest. Breeding habitat there is characterized by coniferous-dominated forests adjacent to wetlands, such as slow-moving streams, peat bogs, sedge meadows, marshes, swamps, and beaver ponds. On migration, the Rusty Blackbird is primarily associated with wooded wetlands. In winter, it occurs primarily in lowland forested wetlands, cultivated fields, and pecan groves. Suitable habitat for the species appears to be decreasing on its breeding range and wintering grounds, due mainly to the loss and degradation of wetlands by human activities.	- The Rusty Blackbird is only found in North America. It breeds in every province and territory in Canada and migrates to most of the central and eastern United States for winter. In Ontario, the breeding range is found in the Hudson Bay Lowlands and northern Boreal Shield ecozones. - The Rusty Blackbird has a wide distribution across boreal regions of Canada. The winter range includes most of the central and eastern United States, although it also winters irregularly in extreme southern Canada.	eBird
Birds	Short-eared Owl <i>Asio flammeus</i>	SC	SC Schedule 1	SC	- The Short-eared Owl lives in open areas such as grasslands, marshes and tundra where it nests on the ground and hunts for small mammals, especially voles. - This species can typically be associated with the following ELC communities: TPO and CUM.	The Short-eared Owl has a world-wide distribution, and in North America its range extends from the tundra south to the central United States. In Ontario, the species has a scattered distribution, found along the James Bay and Hudson Bay coastlines, along the Ottawa River in eastern Ontario, in the far west of the Rainy River District, and elsewhere in southern Ontario, at places such as Wolfe and Amherst Islands near Kingston. Most northern populations are migratory, moving southward in the winter.	NHIC
Reptiles	Snapping turtle <i>Chelydra serpentina</i>	SC	SC Schedule 1	SC	- Snapping Turtles spend most of their lives in water. They prefer shallow waters so they can hide under the soft mud and leaf litter, with only their noses exposed to the surface to breathe. During the nesting season, from early to mid summer, females travel overland in search of a suitable nesting site, usually gravelly or sandy areas along streams. Snapping Turtles often take advantage of man-made structures for nest sites, including roads (especially gravel shoulders), dams and aggregate pits. - This species can typically be associated with the following ELC communities: OAO, SA near gravelly or sandy areas.	The Snapping Turtle's range extends from Ecuador to Canada. In Canada this turtle can be found from Saskatchewan to Nova Scotia. It is primarily limited to the southern part of Ontario. The Snapping Turtle's range is contracting.	NHIC, iNaturalist 2020, ORAA
Birds	Wood Thrush <i>Hylocichla mustelina</i>	SC	THR Schedule 1	END	- The Wood Thrush can typically be found in the interior and along the edges of well-developed upland deciduous and mixed forests. Key elements of these forests include trees that are greater than 16 m in height, high variety of deciduous tree species, moderate subcanopy and shrub density, shade, fairly open forest floor, moist soils and decaying leaf litter. Wood Thrush is more likely to occur in larger forests but may also nest in 1 ha fragments and semi-wooded residential areas and parks. Smaller habitat fragments have lower fecundity when compared to larger fragments. ³ - This species can typically be associated with the following ELC communities: FOD and FOM that are greater than 1 ha in size.	- The Wood Thrush ranges across central and southern Ontario, southern Quebec, New Brunswick and southern Nova Scotia and the majority of the eastern United States. - It winters in Central American between southern Mexico and Panama. ³	- Ontario Breeding Bird Atlas - Wellington Squares 17NJ51, 17NJ52, 17NJ61, 17NJ62 Species List, eBird

Attachment B. Guelph Water Supply Master Plan Updated Study, Species at Risk Habitat Screening

Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat	Known Species Range	Source Identifying Species Record
Birds	Eastern Wood-Pewee <i>Contopus virens</i>	SC	SC Schedule 1	SC	■ The Eastern Wood-Pewee can be found in every type of wooded community in eastern North America. The size of the forest does not appear to be an important factor in habitat selection as this species has been found in both small fragmented forests and larger forest tracks. ⁴ ■ This species can typically be associated with the following ELC communities: FOC, FOM and FOD.	■ The Eastern Wood-Pewee Breed throughout central and eastern North America from Saskatchewan to Nova Scotia south along the Atlantic Coast to North Florida and the Gulf Coast. ⁴	■ Ontario Breeding Bird Atlas ■ Wellington Squares 17NJ51, 17NJ52, 17NJ61, 17NJ62 Species List, iNaturalist 2020, eBird
Insects	Monarch <i>Danaus plexippus</i>	SC	SC Schedule 1	END	■ Throughout their life cycle, Monarchs use three different types of habitat. Only the caterpillars feed on milkweed plants and are confined to meadows and open areas where milkweed grows. Adult butterflies can be found in more diverse habitats where they feed on nectar from a variety of wildflowers. ■ Milkweeds (numerous species) are the sole food plant for Monarch caterpillars. These plants grow predominantly in open and periodically disturbed habitats such as roadsides, fields, wetlands, prairies, and open forests. Milkweeds are often planted outside their native range, and sometimes wayward Monarchs are observed at these patches. Monarchs require staging areas which are used to rest, feed, and avoid inclement weather during migration. In Canada, they are found along the north shores of the Great Lakes where Monarchs roost in trees before crossing large areas of open water.	■ The Monarch's range extends from Central America to southern Canada. In Canada, Monarchs are most abundant in southern Ontario and Quebec where milkweed plants and breeding habitat are widespread. During late summer and fall, Monarchs from Ontario migrate to central Mexico where they spend the winter months. During migration, groups of Monarchs numbering in the thousands can be seen along the north shores of Lake Ontario and Lake Erie. ■ The overall native range of the Monarch occurs from Central America northward through the continental United States to southern Canada, and from the Atlantic Coast westward to the Pacific Coast. The Canadian range of occurrence includes portions of all ten provinces and the Northwest Territories. Monarchs are loosely divided into eastern and western subgroups based on their migratory routes and overwintering sites. Eastern Monarchs breed from Alberta east to Nova Scotia and migrate south to overwinter in the mountains of Central Mexico. The breeding range in Canada is south of the 50° latitude in Ontario, Quebec, and the Maritimes. Each fall hundreds of thousands of Monarchs migrate through Long Point in southern Ontario but it's unknown what proportion of the Canadian population these individuals represent.	■ iNaturalist, 2020, OBA
Insects	West Virginia White <i>Pieris virginiensis</i>	SC	N/A	N/A	■ The West Virginia White lives in moist, deciduous woodlots. This butterfly requires a supply of Toothwort, a small, spring-blooming plant that is a member of the mustard family, since it is the only food source for larvae.	■ The West Virginia White is found from Quebec and Ontario south through New England and the Appalachian region to Georgia. Although common in parts of the United States, this butterfly is rare in Ontario, where it has been seen at about 50 sites. The majority of sites in the province are in central and southern Ontario, but it also extends north to Manitoulin and St. Joseph islands. The largest populations are in the western Lake Ontario region.	■ NHIC
Insects	Yellow-banded Bumble Bee <i>Bombus terricola</i>	SC	SC Schedule 1	SC	■ This species is a forage and habitat generalist, able to use a variety of nectaring plants and environmental conditions. It can be found in mixed woodlands, particularly for nesting and overwintering, as well as a variety of open habitat such as native grasslands, farmlands, and urban areas. Nest sites are often underground in abandoned rodent burrows or decomposing logs. ■ Yellow-banded Bumble Bee occurs in a diverse range of habitats, including montane meadows, prairie grasslands, and boreal habitats. It has been recorded foraging on flowers for pollen and nectar from a variety of plant genera. Yellow-banded Bumble Bee queens overwinter underground and in decomposing organic material such as rotting logs.	■ The Yellow-banded Bumble Bee has a large range throughout much of Canada and parts of the United States. The Yellow-banded Bumble Bee ranges from the Mixedwood Plains of southern Ontario to the Hudson Bay Lowlands in the north. In southern Ontario, it is still observed but is less common than it was historically after steep declines. Less is known about historical or recent abundance of Yellow-banded Bumble Bee in the northern portion of its range. ■ Yellow-banded Bumble Bee occurs in eastern North America from New Jersey to Newfoundland and Labrador, and west through the northern United States and most of Canada to southern Northwest Territories, southeastern Yukon, and eastern British Columbia.	■ iNaturalist, 2019

Attachment B. Guelph Water Supply Master Plan Updated Study, Species at Risk Habitat Screening

Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat	Known Species Range	Source Identifying Species Record
Molluscs	Rainbow <i>Villosa iris</i>	SC	SC Schedule 1	SC	■ The Rainbow mussel prefers small to medium-sized rivers with a moderate to strong current and sand, rocky, or gravel bottoms. It is found in or near riffle areas and along the edges of vegetation in water less than 1 metre deep. All mussels filter water to find food, such as bacteria and algae. Mussel larvae must attach to a fish, called a host, where they consume nutrients from the fish body until they transform into juvenile mussels and then drop off. The Rainbow mussel uses a variety of fish hosts in Ontario, including Striped Shiner, Smallmouth Bass, Largemouth Bass, Green Sunfish, Greenside Darter, Rainbow Darter, and Yellow Perch. ■ The Rainbow is most often found in shallow, well-oxygenated reaches of small-to medium-sized rivers, and sometimes lakes, on substrates (bottoms) of cobble, gravel, sand, and occasionally mud.	■ In Canada, the Rainbow mussel is found only in Ontario in the Ausable, Bayfield, Detroit, Grand, Maitland, Moira, Niagara, Salmon, Saugeen, Sydenham, Thames, and Trent rivers and in Lake St. Clair. It may no longer exist in the St. Clair, Detroit, and Niagara rivers, and Lake Erie. ■ The current distribution of the Rainbow in North America is similar to its historical distribution: from Wisconsin east to Ontario and New York, and south to Oklahoma, Arkansas and Alabama. However, this species has been declining in part of its range—particularly in the Great Lakes, where it has been lost from Lake Erie and the Detroit and Niagara rivers and much of Lake St. Clair. The Maitland River still supports the largest remaining population of Rainbow; overall however, this mussel has been lost from 30% of its historical Canadian range.	■ NHIC

Glossary:

- ESA..... Extirpated - a species that no longer exists in the wild in Ontario but still occurs elsewhere.
- SARA..... Extirpated - a wildlife species that no longer exists in the wild in Canada, but exists elsewhere in the wild.
- ESA..... Endangered - a species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's Endangered Species Act.
- SARA..... Endangered - a wildlife species that is facing imminent extirpation or extinction.
- ESA..... Threatened - a species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.
- SARA..... Threatened - a wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
- ESA..... Special Concern (formerly Vulnerable) - a species with characteristics that make it sensitive to human activities or natural events.
- SARA..... Special Concern - a wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
- OMNR..... Ontario Ministry of Natural Resources
- ESA..... Endangered Species Act
- SARA..... Species at Risk Act (Federal)
- Schedule 1..... The official list of species that are classified as extirpated, endangered, threatened, and of special concern.
- Schedule 2..... Species listed in Schedule 2 are species that had been designated as endangered or threatened, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1
- Schedule 3..... Species listed in Schedule 3 are species that had been designated as special concern, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.
- COSEWIC..... Committee on the Status of Endangered Wildlife in Canada - a committee of experts that assesses and designates which wild species are in some danger of disappearing from Canada.

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Attachment C





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Figure 8. Evaluated and Unevaluated Wetlands in Wellington County

